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ABSTRACT

This annotated bibliography covers international telecommunications, concentrating on reports with possible policy implications for the Office of Telecommunications Policy and other government/industry agencies. Since the scope of international telecommunications policy is broad, the bibliography attempts to provide a framework useful in defining the U.S. role or potential roles within the international telecommunications community. The framework reflects the general scope of international telecommunications that may be of importance to U.S. policy makers, including articles on the technology, economics, industry structures, and legal aspects of telecommunications systems worldwide. An international telecommunications community is inferred, its moods suggested, and its future predicted by various sources. Multinational and international telecommunications programs are documented, as well as telecommunications programs worldwide with only domestic applications. Articles cited on telecommunications in developed and developing countries include both domestic and international applications, emphasizing programs where economic support has originated outside the country. U.S. relationships with these telecommunications systems are documented in several chapters. This is the first of an anticipated series of annual bibliographies for the international telecommunications community and includes sources up to November 1975. (Author/RAO)

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INTERNATIONAL TELECOMMUNICATIONS BIBLIOGRAPHY

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PREPARED IN SUPPORT OF AND FUNDED
BY THE OFFICE OF TELECOMMUNICATIONS POLICY,
EXECUTIVE OFFICE OF THE PRESIDENT

U.S. DEPARTMENT OF COMMERCE
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OFFICE OF TELECOMMUNICATIONS
John M. Richardson, Acting Director

March 1976

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UNITED STATES DEPARTMENT OF COMMERCE
OFFICE OF TELECOMMUNICATIONS
STATEMENT OF MISSION

The mission of the Office of Telecommunications in the Department of Commerce is to assist the Department in fostering, serving, and promoting the nation's economic development and technological advancement by improving man's comprehension of telecommunication science and by assuring effective use and growth of the nation's telecommunication resources.

In carrying out this mission, the Office

- Conducts research needed in the evaluation and development of policy as required by the Department of Commerce
- Assists other government agencies in the use of telecommunications
- Conducts research, engineering, and analysis in the general field of telecommunication science to meet government needs
- Acquires, analyzes, synthesizes, and disseminates information for the efficient use of the nation's telecommunication resources.
- Performs analysis, engineering, and related administrative functions responsive to the needs of the Director of the Office of Telecommunications Policy, Executive Office of the President, in the performance of his responsibilities for the management of the radio spectrum
- Conducts research needed in the evaluation and development of telecommunication policy as required by the Office of Telecommunications Policy, pursuant to Executive Order 11556

INTERNATIONAL TELECOMMUNICATIONS BIBLIOGRAPHY

TABLE OF CONTENTS

Chapter No.		Page No.
1.	Introduction	1.1-1.2
2.	U.S. International Communications Industry	2.1-2.37
	a. Government Regulation	2.2-2.7
	b. Government Policy	2.8-2.11
	c. Services	2.12-2.20
	d. Facility Planning - Traffic Forecasts, Demand	2.21-2.32
	e. Industry Structure	2.33-2.37
	f. Rates and Tariffs	2.37
3.	Non-U.S. Telecommunications Systems and Programs	3.1-3.11
4.	Telecommunucations Technology	4.1-4.32
5.	International Environment and Organization	5.1-5.27
6.	International Trade	6.1-6.5
7.	International Financial and Technical Cooperation	7.1-7.5
8.	International Telecommunications Law	8.1-8.25
	a. International Law Applied to Telecommunications	8.2-8.3
	b. Law of Space	8.4-8.5
	c. Space Telecommunications	8.6-8.22
	d. Law and Military Uses of Outer Space	8.23-8.25
9.	Glossary	9.1-9.2
10.	List of Research Facilities	10.1
11.	Author Index	11.1-11.8
12.	Subject Index	12.1-12.12

CHAPTER ONE

Introduction

The following annotated bibliography covers many issues and diverse aspects of international telecommunications. The purpose of a reference guide on international telecommunications is to provide easy access to up-to-date and useful information for OT and OTP staffs, and to other government agencies, industry, and parties elsewhere with interest in international telecommunications. To prevent the document from becoming unmanageable or irrelevant to the needs of OT and OTP staffs, it concentrates on reports with possible policy implications.

Since the scope of international telecommunications policy is broad, the bibliography attempts to provide a framework useful in defining the U.S. role or potential roles within the international telecommunications community. The framework reflects the general scope of international telecommunications that may be of importance to U.S. policy makers, including articles on the technology, economics, industry structures, and legal aspects of telecommunication systems worldwide. An international telecommunications community is inferred, its moods suggested, and its future predicted by various sources.

Multinational and international telecommunications systems are documented, as well as telecommunications programs worldwide with only domestic applications. Articles on telecommunications in developed and developing countries are cited, again both domestic and international applications, emphasizing programs where economic support has originated outside the country. U.S. relationships with these telecommunications systems are documented in several chapters.

The bibliography is divided into 12 sections. This introduction (1) precedes Chapters (2) - (8), which list telecommunication references with brief annotations. Following the bibliographical citations are a glossary (9), a list of useful telecommunication resources (10), an author index (11), and finally a subject index (12).

Chapters (2) - (8) have expansive titles since many articles listed cover a broad range of subjects and ideas. Articles frequently appear in more than one chapter although rarely in more than two or three, despite their relevance to subsequent chapter titles. The reader must consult the Subject Index (12) for location of specific subjects.

The bibliography consists primarily of magazine articles, but contains a number of books and professional papers. Few references pre-date 1970. One source that was not tapped in this effort, due to its unique indexing system which is inconsistent with the remainder of the bibliography, has been the United Nations. Documents from the UN are available only at specific UN depositories - select libraries in major cities where UN documents are filed. Contact with UN depositories (the Library of Congress in Washington, D.C. is the appropriate location in Washington) is suggested for additional definitive reports, including much recent work on direct broadcast satellites.

This bibliography is to be considered a preliminary document, open to comments and suggestions on its content and structure. It is the first of an anticipated annual effort to provide the international telecommunications community with a yearly telecommunications bibliography. The first International Telecommunications Bibliography includes sources up to November, 1975.

CHAPTER TWO

U.S. International Communications Industry

This chapter is subdivided into six sections, with some subjects and articles reappearing when relevant to more than one subtitle.

(a) "Government Regulation" provides an overview of the economic and regulatory framework that exists for the U.S. communications industry (pp. 2.2-2.8).

(b) "Government Policy" looks at regulation from the standpoint of U.S. policy (pp. 2.9-2.11).

(c) "Services" covers specific technologies and the services and systems they provide or will provide in the future (pp. 2.12-2.20).

(d) "Facility Planning - Traffic Forecasts, Demand" cites a number of studies, including analyses of demand for telecommunications, and various econometric models, as they relate to the U.S. role in telecommunications technology (pp. 2.21-2.32).

(e) "Industry Structure" is highlighted by articles on the corporate structures of major international telecommunications industries. Affects of regulatory structure and market on industry are indicated, as are industry structure's affects on telecommunications growth and trends (pp. 2.33-2.37).

(e) "Rates and Tariffs" (p. 2.37).

U.S. International Communications Industry, cont'd.

a) Government Regulation

Averch, Harvey & Johnson, Leland, "Behavior of the Firm Under Regulatory Constraint", American Economic Review, Dec. 1962, pp. 1052-1069.

Develops a theory of the monopoly firm (the domestic telephone and telegraph industry) seeking to maximize profit but subject to regulatory constraint on its rate of return.

Borchardt, Kurt, Structure and Performance of the US Communications Industry, Harvard Press, Boston, 1970, 180p.

Concerns evaluating and managing the structural problems of the communications industry that result from the interaction of public regulation and rapidly changing technology. Suggests modifications in regulatory procedures to ensure efficient industry in environment of new technologies and growing demands for increasingly diverse services.

Capron, William M., Technological Change in Regulated Industries, Brookings Institutions, Washington, D.C. 1971, 238p.

Introductory chapter deals with characteristics of regulation and regulated industries, and the effects of regulation on innovation. Chapter on "The Competitive Margin in Communications" has sections on the regulatory issues and measures, the sector, seven hypotheses, and policy implications.

Colby, D.B., Compatibility Planning for Improved Spectrum Use --- Federal Telecommunication Electromagnetic Spectrum Management, paper presented at the AIAA 5th Communications Satellite Systems Conference, Los Angeles, Calif., April 22-24, 1974, 7 p.

Deals with frequency assignment, communication equipment, economic factors, government/industry relations, policies.

Cole, Jack, "International Telecommunications: Policy, Planning and Regulation," masters thesis, George Washington University, 1971, 220p.

This is a broad survey of international telecommunications, with chapters on background information, FCC cases involving international telecommunications, comparison of submarine cable and satellite system characteristics, economic analysis of international satellite and submarine cable systems, the need for U.S. policy and planning guidelines, and proposed resource decision-making process and planning guidelines.

Connolly, Ray & Scrupski, Stephen E., "Can the FCC Cope With Changing Technology?", Electronics, July 25, 1974, pp. 106-113.

Says that the FCC's new leadership "is handicapped by limited resources and static budget that doesn't reflect shifting workload."

Emerine, R.J., et al., A Planning Study for an Investigation of Corporate Structures in the Telecommunications Common Carrier Industry, Abt Associates, Inc., Cambridge, Mass., 1974, 259p.

Study is result of FCC's interest in the implications of vertical integration and holding company structure of common carrier firms. Contains chapters on industry description, price analysis, rate of return analysis, economic theory, effects of monopoly, effects of regulation, effects of vertical integration, effects of corporate structure on innovation: evidence & analysis, policy recommendations, and recommendations for future work.

Ende, Asher H., "International Telecommunications: Dynamics of Regulation of a Rapidly Expanding Service", Law and Contemporary Problems, Spring 1969, pp. 389-416.

Gives a detailed historical analysis of U.S. regulation of the international telecommunication carriers. Topics include: 1) a profile of the regulatory mission, 2) development of the industry and regulatory policy, 3) moving into the satellite era, 4) earth station ownership, 5) competing cable applications, 6) authorized user inquiry, 7) rates, 8) merger of international carriers, 9) summary of commission policy.

Geller, H., A Modest Proposal to Reform the Federal Communications Commission, Rand Corp. Paper, Santa Monica, Calif., April 1974, 52 p.

"How can the political environment of the FCC be changed?" The author addresses this question in terms of what he maintains is the root problem. The FCC's overidentification with the powerful elements of the regulated industries at the expense of the public interest. Detailed examples are given of this root problem, in the areas of rule-making and adjudication.

Hines, Sara, Bibliography on the Federal Communications Commission, May 1, 1974, 13 p.

Discusses government/industry relations, aircraft communication, communication cables, international cooperation, submarine cables, transoceanic communication.

Hume, C. R., "Communications Satellites and the International Communications Industry", Journal of the British Interplanetary Society, Feb. 1973, pp. 65-76.

Discusses government/industry relations, aircraft communication, communication cables, international cooperation, submarine cables, transoceanic communication.

Johnston, F.J.H., "The Financing of Essential Communication, Navigation and Terminal Aids", Aeronautical Journal, April 1973, pp. 175-180.

Deals with aircraft communication, government/industry relations, international cooperation, cost and economic analyses.

Kahn, Alfred E., The Economics of Regulation: Principles and Institutions, Vols. 1 & 2, Wiley & Sons, Inc., N.Y., 1970, 564p.

First volume deals with economic principles, with chapters on the rationale of regulation, traditional issues, marginal cost pricing, application of marginal costs, decreasing costs and price discrimination, rate-making, and qualifications. Second volume concerns institutional issues, with chapters on monopoly, incentives and distortions, positive influences on public utility performance, role and definition of competition, destructive competition and service quality, and regulated monopoly.

Naleszkiewicz, Wladimir, Proposed Guidelines for Improving the Efficiency of Present and Future Regulation of the US Overseas Common Carriers, Prepared for the FCC, Common Carrier Bureau, 1970, 125p.

Develops guidelines for studies "which would analyze present policies and practices of the Commission in its regulation of common carriers providing overseas telecommunication services and to indicate the manner in which such regulation may be improved through a more effective use of modern concepts and tools of economics."

Owen, Bruce M., The International Communication Industry, the TAT-6 Decision, and the Problem of Regulated Oligopoly, Center for Interdisciplinary Research, Stanford University, Stanford, Calif., 1973.

Examines the problem of maintaining a balance between cable and satellite telecommunications, with particular regard to the TAT-6 decision.

Peck, Merton J., "The Single-Entity Proposal for International Telecommunications", The American Economic Review, May 1970, pp. 199-203.

Analyzes the economical combination of cable and satellite investment, why the present (1970) organization of the industry and its regulation fall short of this economical combination, and in what ways the single-entity proposal would be an improvement.

Raynor, Richard A., "Competition Within a Regulated Environment", Public Utilities Fortnightly, July 4, 1974, pp. 24-32.

"Changes in traditional regulatory policy have resulted from external pressures exerted on regulatory agencies. Although the FCC has introduced the potential of competition in the industry, no definite regulatory guidelines have been established. The author suggests that new entrants to this field must actively participate in the regulatory arena to insure their continued viability."

Report and Recommendations to the Senate and House Commerce Committees, Intergovernmental Committee on International Telecommunications, Govt. Printing Office, April 1966, 33p.

Presents brief overview of international telecommunications, with sections of present industry structure, national policy, performance and trends, problems, performance under alternative structures, and recommendations.

Shepherd, William G. & Gies, Thomas G., eds., Regulation in Futher Perspective: The Little Engine that Might, Ballinger Publishing Co., Cambridge, Mass., 1974, 138p.

Consists of chapters on regulation, entry and public enterprise; regulatory reform; a critique of regulatory accommodation to change; the Averch-Johnson hypothesis after ten years; perspectives on CATV regulation; reversals in peak and offpeak prices; a method for setting norms in regulated industries; and why industries are regulated.

Sperry, Robert, "A Selected Bibliography of Works on the Federal Communications Commission," Journal of Broadcasting, Winter 1975, p. 1.

Unannotated listing of articles, government documents, law review discussions and FCC releases dealing with the Commission and its activities; also includes material on and about OTP. Covers period 1970-1973.

Stanley, Kenneth B., "International Telecommunications Industry: Interdependence of Market Structure and Performance Under Regulation", Land Economics, November 1973, pp. 391-403.

Studies the different aspects of the international telecommunications industry market structure, especially as it is affected by regulation. Examines investment behavior of Comsat and AT&T, pricing policies and market structure, and gives suggestions to improve industry performance.

Trebing, Harry M., ed., Essays on Public Utility Pricing and Regulation, Michigan State University Press, East Lansing, Mich., 1971, 469p.

Consists of sections dealing with economic theory and public utility pricing; applied pricing practices and problems; pricing, competition and market structure; regulatory policies and pricing practices; the environmental and regulatory setting.

Trebing, Harry M., "Realism and Relevance in Public Utility Regulation", Journal of Economic Issues, June 1974, pp. 209-233.

Considers orthodox and institutionalists' views on public utility regulation and directions for reform in the commission system.

United States Code Annotated, Title 47, Telegraphs, Telephones and Radiotelegraphs.

Contains "all laws of a general and permanent nature under arrangement of official code of the law of the United States."

Wilcox, Clair, Public Policies Toward Business, Richard D. Irwin, Inc., Homewood, Ill., 4th edition, 1971, 858p.

Section on monopoly control by regulation contains, among others, chapters on the rate level and structure and regulation of communications.

b) Government Policy

Bobroff, Sara A., United States Treaties and Other International Agreements Pertaining to Telecommunications, U.S. Department of Commerce, Office of Telecommunications, January 1974, 175p.

This is an up-to-date reference source for all U.S. treaties and other international treaties which relate to telecommunications.

Cole, Jack, "International Telecommunications: Policy, Planning and Regulation," masters thesis, George Washington University, 1971, 220p.

This is a broad survey of international telecommunications, with chapters on background information, FCC cases involving international telecommunications, comparison of submarine cable and satellite system characteristics, economic analysis of international satellite and submarine cable systems, the need for U.S. policy and planning guidelines, and proposed resource decision-making process and planning guidelines.

Final Report; President's Task Force on Communications Policy, December 7, 1968, 414p.

This is the comprehensive study of communications policy made by the Task Force assigned by President Johnson in 1968. Subject material includes the organization of the U.S. international communications industry, the future of INTELSAT, satellite communications and educational television in developing countries, domestic applications of communication satellite technology, the domestic telecommunications carrier industry, future opportunities for television, the use and management of the electromagnetic spectrum, and the roles of the federal government in telecommunications.

Foreign Policy Implications of Satellite Communications, Committee on Foreign Affairs (U.S. House), April 23, 28, & 30, 1970, 116 p., (avail. Subcommittee on National Security Policy & Science Development).

Gives Congressional testimony on foreign policy aspects of satellite broadcasting and television development.

Goldhammer, H., & R. Westrum, The Social Effects of Communication Technology, Rand Corp. Report, Santa Monica, Calif., 1970, 38 p.

Social effects are discussed in the fields of education, political behavior, crime, economic life, governmental regulatory action, and the quality of life.

International Communications; Objectives and Policy, Office of Telecommunications Policy, February 1973, 10p.

Briefly presents background information on the U.S. international communications industry and outlines the primary objectives and policy of the United States.

Lago, Armando, "Demand Forecasting Models of International Telecommunications and Their Policy Implications", The Journal of Industrial Economics, November 1970, pp. 6-21.

Investigation of factors affecting international telecommunications traffic, model estimating methodologies, demand functions, public policy implications.

McIntyre, Stuart H., "U.S. Cautions Against Premature International Regulation of Developing Direct Broadcast Satellite Technology", Department of State Bulletin, July 30, 1973, pp. 197-200.

Excerpts from statement made on June 15, 1973, to the Working Group on Direct Broadcast Satellites of the UN Committee on the Peaceful Uses of Outer Space, on satellites in communication, particularly in broadcasting.

Oslund, Jack, "Communications Satellite Policy: Revolutionary or Evolutionary?", PHD dissertation, The American University, 1975, 387 p.

A policy analysis of U.S. international communications policy through four "eras" of transoceanic telecommunications technology--submarine telegraph cables, radio, submarine telephone cables and satellites. Particular attention is paid to the development of the communications satellite policies of the Eisenhower and Kennedy Administrations which preceded the enactment of the Communications Satellite Act of 1962.

Owen, Bruce & Lasher, Sebastian, International Telecommunication Facilities in the Decade of the Seventies, Office of Telecommunications Policy, January 1971, 42p.

This is an analysis of data and policy options available to OTP, with chapters on cost analysis, national security requirements, political considerations, reliability, policy options for OTP, conclusions and recommendations.

Report and Recommendations to the Senate and House Commerce Committees, Intergovernmental Committee on International Telecommunications, Govt. Printing Office, April 1966, 33p.

Presents brief overview of international telecommunications, with sections on present industry structure, national policy, performance and trends, problems, performance under alternative structures, and recommendations.

c) Services

Ball, J.E.D., "Some Technical Considerations in Providing Television Coverage by Satellite," Journal of the Society of Motion Picture and Television Engineers, February 1972, pp. 97-99.

Deals with international cooperation, satellite networks, television systems, cost analysis.

Belotserkovskiy, O.M., "Space & Education", NASA translated from "Kosmos I Obrazovaniy" Znaniye Press, Moscow, 1972, 53 p., (avail. NTIS).

Looks at communication satellite systems for educational television.

Berman, G., "The Quality of International Leased Channel Service", RCA Engineer, October/November 1973, pp. 8-11.

Describes RCA Globcom's operations in lease channel service. Discusses channel troubles, trouble detection and recording, service assurance operations, channel reliability, results of quality program, untroubled service concept.

Blake, Gordon A., "Satellite Communications", Telephone Engineer and Management, June 15, 1971, pp. 56-61.

First of a six-part series, this article gives historical information on the growth of international communications service.

Charyk, J.V., "Future of Satellite Telecommunication Systems", Telecommunication Journal, May 1971, pp. 296-300.

Discusses difference between terrestrial and satellite facilities, growth of satellite systems, potential for the newer services, technological developments, multipurpose satellites, inter-system coordination, and the longer-term future.

Evans, B.G., & Farell, E., "Satellite Charges for a Mixed Pre-Demand-Assigned System", IEEE Transactions on Aerospace and Electronic Systems, September 1972, pp. 583-590.

Subjects include cost and economic analyses, financial management, frequency assignment, systems engineering.

Farrar, J.R., "Some Recent Developments in International Datel Services", Point-to-Point Communication, May 1973, pp. 73-81.

Gives a general appraisal of international Datel services with reference to main areas of activity - U.S., U.K. and Europe in general. Gives design requirements for equipment which will satisfactorily operate over international telephone networks, including synchronous satellite channels.

Feldman, Nathaniel & Charles Kelly, "The Communication Satellite - A Perspective for the 1970"s", Astronautics and Aeronautics, September 1971, pp. 22-29.

Forecasts the potential telecommunication trends in the 1970's. Looks at point-to-point communications, switching, foreign CATV, small-terminal service, Canadian communications technology satellite program.

Goode, George E., "New Developments in Data and Voice Security", Telecommunications International, March 1974, pp. 35-37.

As use of communications increases, so will concern about protection of proprietary information - recommends the use of all-electronic scramblers.

Haviland, R.P., "Individual and Thin-Route Communications by Satellite", Telecommunication Journal, December 1973, pp. 771-783.

Examines feasibility of establishing two-way telephone communication to individual subscribers and thin-route exchange terminals via satellites. Cost, performance and capacity objectives are discussed and modulation techniques, channel allocation procedures, call logic, etc., are considered.

Hornish, William M., "Communications Progress with Computers", Telecommunications International, July 1973, pp. 44-45.

Cites the success of Western Union's Mailgram, describes its operation, and mentions Western Union's negotiations to expand the service internationally.

"How to Get Worldwide Mileage Out of Your Management Data", Business Abroad, July 1970, pp. 7+.

Reports on an inquiry made by The Diebold Group - an international management consulting and computer firm - into the manner in which multinational corporations manage their computers and data systems. Details of the inquiry are not disclosed, but a general view is given, showing the scarcity of multinational information systems. Analyzes the problems associated with the international system and makes recommendations.

Intartaglia, Dominick A., "The Control Center - Vital in International Communications", Telecommunications International, April 1973, pp. 45-50.

Describes the role of the international record carriers' control center in establishing and maintaining high quality transmission links for the international communicators, alarms, fault location, identification and restoration of service.

International Conference on Numerical Telecommunications by Satellite, 2nd, Paris, France, November 28-30, 1972, Proceedings, Societe des Electricians, des Electroniciens et des Rottiselectriciers and Organisation Internationals des Telecommunications par Satellite, Paris, France, 1972, 468 p.

Deals with digital systems, pulse communication, satellite transmission, European space programs, Intelsat, international cooperation, multichannel communication, phase shift keying, satellite television, signal encoding, time division multiplexing.

Israel, D.R., Aerosat - An Aeronautical Communications Satellite for Oceanic Areas, paper presented at the AIAA 9th Annual Meeting and Technical Display, Washington, D.C., January 8-10, 1973, 10 p.

Discusses relay satellites, transoceanic communication, financial management, international cooperation, synchronous satellites.

Israel, D.R., "Aerosat - An Aeronautical Satellite Program", in National Telecommunications Conference, Atlanta, Georgia, November 26-28, 1973, Conference Record, vol. 2, Institute of Electrical & Electronics Engineers, 1973, pp. 27B-1 to 27B-3.

Deals with aeronautical satellites, international cooperation. UHF, digital systems, economic factors.

Israel, D.R., "Aerosat Overview --- Aeronautical Satellites for Oceanic ATC" in EASCON '73; Electronics and Aerospace Systems Convention, Washington, D.C., September 17-19, 1973, Record, Institute of Electrical & Electronics Engineers, N.Y., 1973, pp. 135-138.

Deals with aeronautical satellites, navigation, aircraft communication, cost effectiveness, international cooperation, radio communication, VHF.

"ITT Worldcom Communications Control Centre", Telecommunication Journal, June 1971, pp. 463-465.

Describes the functions of ITT's new quality control system in 1) detection of potential or real problems, 2) diagnosis of unit or system at fault, 3) correction of fault and test of correction, 4) restoration of service.

Kotsolios, N. & Williamson, E., "DVTS Control Center", RCA Engineer, October/November 1973, pp. 12-13.

Describes RCA Globcom's new control center for data, voice and television services to insure rapid detection and correction of transmission difficulties.

Larsson, L., "Telecommunication in the Society of Tomorrow", Tele (Eng. Ed.)-(Sweden), 1972, no. 2, pp. 68-80.

Discusses economic growth, cost development, degree of innovation, requirements and demands of customers, development of transmission network and terminals, society's need of telecommunications.

La Vean, Gilbert & Edward Martin, "Communication Satellites: The Second Decade", Astronautics and Aeronautics, April 1974, pp. 54-60.

Discusses latest trends in space telecommunications: ITU projects; Intelsat system; Canadian Telesat system; U.S. domestic systems; projects by Comsat/AT&T, Western Union, American Satellite Corp., General Telephone & Electronics, RCA Globcom, and CML; military systems; Russian Molniya system; mobile systems; technology trends.

Loomis, H., The Impact of Communication Satellites on Television, paper presented at the AIAA 10th Annual Meeting and Technical Display, Washington, D.C., January 28-30, 1974, 7 p.

Discusses satellite television transmission, economic analysis, international cooperation, satellite networks.

Pipe, Russell, Towards Central Government Computer Policies, Data Base Developments and International Dimensions, 1973, 215 p.

Outlines data base policy issues, establishing computer utilization policies by central governments, analysis of patterns of data base policy development, formation of international and supra-national computer linkage systems.

Pritchard, W.L. & Puente, J.G., "The Advantages of Demand Assignment for International Satellite Communication Systems", Telecommunications, March 1971, pp. 27-33.

Discusses demand-assignment multiple-access system for INTELSAT.

Rogers, J.C., "Development and Principles of Cable Restoration", RCA Engineer, October/November 1973, pp. 16-18.

Examines the problem of restoring interrupted services quickly and effectively and the solution of providing alternate means to link the terminals of the failed media and planning for its availability on short notice. Notes the unprecedented growth in market for new services.

Sarkar, S.K., "Planning of a Broadcast-Satellite Service", IEEE Transactions on Broadcasting, September 1972, pp. 72-76.

Discusses international cooperation, regulations, spacecraft communication, frequency assignment, radio reception, space stations.

Sarkar, S.K., Television Broadcast Satellite Direct-to-Home, paper presented at the International Astronautical Federation's 21st International Astronautical Congress, Konstanz, West Germany, October 4-10, 1970, 18 p.

Discusses TV broadcast satellites' program distribution direct to home by network and by community.

Sdougos, Z.N., "Potential Response of Maritime Services to Craft and Persons in Distress at Sea", in International Space Rescue Symposium, 4th, Brussels, Belgium, September 21, 1971, Proceedings, International Academy of Astronautics, Paris, 1973, pp. 149-166.

Discusses international cooperation, navigation satellites, radio equipment.

"The Top 300 in World Banking; Annual Review", Banker, June 1973, pp. 611-691.

Mentions data transmission systems and Society for Worldwide Interbank Financial Telecommunications.

Turner, C.K., "The Use of Satellites to Meet Future Press Requirements", Industries Atomiques et Spatiales, May-June 1972, pp. 98-107.

Deals with international cooperation, satellite transmission, data transmission, economic factors, European space programs, satellite networks, signal to noise ratios.

Whitman, J.G. & Davison, W.W., "The New Hotline - Via Satellite Direct Communications Link", Signal, March 1974, pp. 52-55.

Discusses ground stations, Intelsat, international cooperation, point-to-point communications, data transmission, satellite tracking, systems engineering, USSR and U.S.

Wright, L.M.B., "Satellites for Civil Aviation", Interavia, vol. 25, 1970, pp. 280-282.

Examines civil aviation satellites for aircraft communication, navigation and traffic control, discussing technical, political and administrative problems.

Zeidler, Gerhard, "Coin Telephone NT 2000: Modern Technologies Clear the Way to Global IDDD," IEEE Transactions on Communications, Sept. 1974, pp. 1302-1304.

Describes the concept and design of the Coin Telephone NT 2000 which is suitable for global international direct distance dialing.

Zeidler, G., "NT 2000 Coin Telephone for Worldwide Direct Distance Dialing", Electrical Communication, Vol. 49, No. 2, 1974, pp. 144-148.

Gives details of the NT 2000 (ITT trademark) coin telephone, which is capable of worldwide international direct distance dialing. Designed for universal application, the NT 2000 equipment can be used in most countries with no major modification.

d) Facility Planning - Traffic Forecasts, Demand

Analysis of US Demand for International Telecommunications Services, Communications Satellite Corp., Regional Study No. 5, April 1969, 37p.

Studies historical trends in telecommunications services, with chapters on general tariff structure, analysis of growth, and structure and growth of 10 main correspondents.

Baczko, Henryk, "Some Thoughts on the Reliability of Telecommunication Networks", Telecommunication Journal, December 1974, pp. 729-732.

Definition of reliability and concept of failure in telecommunication networks are analyzed; main reliability characteristic in telecommunication networks is defined. Difficulties encountered by maintenance staff, manufacturers of equipment and the CCITT in their work on reliability are discussed.

Baumol, William J. & Klevorick, Alvin K., "Input Choices and Rate-of-Return Regulation: An Overview of the Discussion," The Bell Journal of Economics & Management Science, Autumn 1970, pp. 162-190.

Reviews the substance of the literature stemming from the Averch-Johnson model of the firm under rate-of-return regulation. Examines a number of propositions and describes two models involving regulatory lag. Offers some evaluative comments on the "A-J effect" and its importance in regulatory economics.

Bazzy, William, "Telecommunications - A Responsibility for World Trade", Telecommunications International, April 1973, pp. 21-22.

Discusses balances of trade and payments, and the opportunities for the rapidly expanding telecommunications industry through the 1980's.

Brod, Ernest, "IDDS - A Step in the Right Direction", Telecommunications International, April 1974, pp. 41+.

Analyzes the potential market demand for WUI's International Digital Data Service (IDDS).

Coburn, Alan R., "Satellite Communications", Telephone Engineer and Management, September 15, 1971, pp. 42-47.

Third of a six-part series, this article discusses the factors involved in earth station technology: improving the stations, locating earth station sites, costs and trends, unmanned stations.

Cole, Jack, "International Telecommunications: Policy, Planning and Regulation," masters thesis, George Washington University, 1971, 220p.

This is a broad survey of international telecommunications, with chapters on background information, FCC cases involving international telecommunications, comparison of submarine cable and satellite system characteristics, economic analysis of international satellite and submarine cable systems, the need for U.S. policy and planning guidelines, and proposed resource decision-making process and planning guidelines.

Collins, Arthur A. & Pedersen, Robert D., Telecommunications; A time for Innovation, Merle Collins Foundation, Dallas, Texas, January 1973.

178 page book on new technical developments in switching network structures, switch design studies, digital connecting links, traffic flow analysis, changing character of traffic and telecommunications services, call processing and system control.

Dawidzuik, B.M. & Preston, H.F., "Comparative Evaluation of Modern Transmission Media for Global Communications", Telecommunication Journal, February 1971, pp. 80-91.

Discusses principle parameters influencing decision-making by operating administrations when planning investment in international telecommunications. A formula is developed for evaluation of economic trade-offs in terms of circuit density and distance for both submarine cables and satellites.

Dawidzuik, B.M., "Have Satellites Sunk the Submarine Cable?", Telecommunications, March 1975, pp. 25ff.

Shows submarine cables as essential element of modern international communications network. Traces the development of submarine cable, including technological improvements, growth, costs, and the place it holds in today's international telecommunications network.

Dill, George D., "Comparison of Circuit Call Capacity of Demand-Assignment and Preassignment Operation", COMSAT Technical Review, Spring 1972, pp. 243-256.

Develops a model of the traffic handling capacity of low density telecommunication trunks. Uses model to derive the relative improvement to be gained on terrestrial access circuits and in satellite transponders by using fully variable destination demand-assigned circuits to service the low-density links.

Durrani, S.H., "Trends in Commercial Communications Satellite Systems: Present and Future", Telecommunications, February 1972, pp. 17-20.

Discusses trends toward using smaller earth stations and satellites employing higher frequencies, larger power, larger antennas, multiple beams, and new modulation and multiple-access methods.

Econometric Model of Demand for International Telecommunications, (Preliminary & Continuing Reports), Communications Satellite Corp., Special Study No. 12-1, 1969.

Presents preliminary results of construction of econometric model of total demand for international telecommunications services by countries and by different levels of development.

Economic Value of Ocean Resources to the United States, Robert R. Nathan Associates, prepared on contract to the Congressional Research Service, submitted to the Senate Commerce Committee May 1974.

Under the section entitled "Communications", is a report written by Gene Trisko dealing with estimated transoceanic cable communications revenues for 1972, 1985 and 2000.

Economics of Computer Communication Networks, 3rd semi-annual report, Center for Interdisciplinary Research, Stanford University, Stanford, Calif., June 1974.

Summarizes activities under grant on Economics of Computer Communication Networks from December 1, 1973 to May 31, 1974. Includes section on international planning and standards for computer communications and the role of the ITU in computer communications.

Engel, Gerald R., "Satellite Communications", Telephone Engineer and Management, November 15, 1971, pp. 46-50.

Fifth of a six-part series, this article deals with the economics of commercial space communications: cost trends, uniqueness of satellite technology, cost functions, pricing considerations, off-peak rates.

European Participation in the Definition of the Next Generation Communication Satellite, Laboratoire Central de Recherches Thomson-CSF, Orsay, France, June 1973, NTIS no. N74-17682.

Gives a study to define the new generation Intelsat V communications package, along with traffic requirements. Traffic matrix for Atlantic and Pacific zones for the 1983 period are compared and show that some arrangements should be provided in order that the same satellite be capable of working over any ocean. Salient features of Atlantic traffic are analyzed and Intelsat V transponder plans are investigated. Defines the optimal communication packages suitable for the technology satellite Intelsat V.

Evans, B.G. & Farell, E., "Satellite Charges for a Mixed Pre-Demand-Assigned System", IEEE Transactions on Aerospace and Electronic Systems, September 1972, pp. 583-590.

Subjects include cost and economic analyses, financial management, frequency assignment, systems engineering.

Feldman, N., The Communication Satellite -- A Perspective for the 1970's, Rand Corp. Paper, Santa Monica, Calif., 1971, 11 p.

"If potential users of high-power satellites make the necessary arrangements for frequency assignments, user agreements, financing, regulation, and legislation (both national and international) and establish appropriate interfaces with other communication entities and systems, then many new applications with large growth potential can be developed for populated as well as underdeveloped regions."

Garner, W.B. & Stamminger, R., "Future Communications Satellite - Definition of Three Basic Concepts", in International Conference on Communications, Seattle, Washington, June 11-13, 1973, Conference Record, Vol. 1, IEEE, N.Y., 1973, pp. 3-8 to 3-11.

Discusses cost effectiveness, market research, satellite networks, technological forecasting, channel capacity, international cooperation, microwave transmission, multichannel communication, radio relay systems.

Gimpelson, Lester A., "Communications Planning for Developing Countries", Electrical Communication, Vol. 48, No. 4, 1973, pp. 359-364.

Examines five aspects of planning which are particularly important for a high growth area: forecasting, service concept, planning technology, appropriate communications equipment, and technological flexibility.

Hupe, Howard H., "Cost-Effectiveness of an Interactive Broadcast Satellite," Astronautics and Aeronautics, January 1975, pp. 63-67.

Examines two aspects of cost-effectiveness: cost itself, which can be dealt with quantitatively, and the qualitatively analyzed aspect concerning the difficulty of organizing, managing, and conceptualizing any two way interactive, feedback, or conferencing system involving large numbers of participants spread over large areas.

"Intelsat System Options Weighed", Aviation Week and Space Technology, October 29, 1973, pp. 45-52.

Examines the decision of whether to begin preparation of specifications for new-generation Intelsat V spacecraft or buy more Intelsat IVA spacecraft and defer development of new design for 2-4 years.

"International Communications - Trends and Directions", Telecommunications International, October 1973, pp. 45-52.

Describes the needs and interests which have grown in the international transmission of data and facsimile and interconnection with a domestic switched communication network; communications executives express their views and opinions on different aspects of the subject.

International Facilities Study, Office of Telecommunications Policy, May 1971, NTIS no. PB-208 670.

Studies the economics and technical characteristics of underseas cables and communications satellites or alternative means of satisfying trans-Atlantic communications needs in the 1970's. Covers capacity needs, technical performance and costs. SF and SG cable technology is compared to Intelsat IV satellite technology.

Johnston, F.J.H., "The Financing of Essential Communication, Navigation and Terminal Aids", Aeronautical Journal, April 1973, pp. 175-180.

Deals with aircraft communication, government/industry relations, international cooperation, cost and economic analyses.

Kimbel, Dieter, Computers and Telecommunications: Economic, Technical and Organizational Issues, OECD, 1973, 222 p.

Studies the interaction of computers and telecommunications in such areas as technological development, macroeconomic considerations, market entry issues, economic planning and policy considerations, and international cooperation.

Lago, Armando, "Demand Forecasting Models of International Telecommunications and Their Policy Implications", The Journal of Industrial Economics, November 1970, pp. 6-21.

Investigates the factors affecting international telecommunications traffic, model estimating methodologies, demand functions, public policy implications.

Leland, Hayne, "Regulation of Natural Monopolies and the Fair Rate of Return", The Bell Journal of Economics & Management Science, Spring 1974, pp. 3-15.

Develops a general concept of fair return based on an equilibrium model of production under uncertainty. Proposes regulatory behavior which will induce firms to make efficient input choices, while at the same time guaranteeing fair returns.

Lerner, Eugene M., "Impact of Competition on Rate of Return," Public Utilities Fortnightly, December 5, 1974, pp. 28-33.

"During an inflationary period cost of utilities increases dramatically while their ability to raise funds and undertake capital expenditures becomes impaired." This article considers the question: "Can a utility be competitive in the factor market, regulated in the product market, and still maintain its financial integrity?"

Lerner, N.C., "Evolution and Development of Forecasting Techniques for US International Telecommunications Traffic", doctoral dissertation, American University, 1968.

This was an early attempt to build an econometric forecasting model for international telecommunications traffic. It specifies international telecommunications traffic as a function of population, trade, and investment.

Lipinski, Andre J., "On the Mix of Satellites and Cables in the Global Network", IEEE Transactions on Communication Technology, April 1967, pp. 170-178.

Comparative economics of satellites and submarine cables were established by studying eight countries. For operational reasons - flexibility, reliability and avoidance of long time delay - a combination of satellite and cable connections is preferable and likely to continue.

Madigan, H., "Earth Stations - Operator's Viewpoint", Point-to-Point Communication, September 1972, pp. 139-149.

Discusses processes involved in constructing satellite earth station: decision that global traffic requirements are best handled by this method, viability study on levels of revenue and profit to be derived from earth station operation, site selection, tender invitation and evaluation, staffing, training, acceptance testing and Intelsat relationship.

Naleszkiewicz, Wladimir, "International Telecommunications - Testing a Forecasting Model of Demand", Telecommunication Journal, September 1970.

Attempts to construct and test an econometric model of the aggregate demand for international telecommunications services among different countries at different levels of economic development.

Ostergren, C.N., "Is the Averch-Johnson Theory Tenable?", Public Utilities Fortnightly, January 30, 1975, pp. 28-32.

Gives a critical analysis of the Averch-Johnson theory as it relates to the present-day structure of AT&T.

Reid, A.L., "CEPT Long Term Telecommunications Studies," IEEE Transactions on Communications, September 1974, pp. 1440-1446.

Describes and discusses the CEPT studies on the following subjects: long term growth of telephone service, external factors likely to influence long term demand for telecommunications, possiblities for new telecommunications services arising from technological developments, application of advanced telecommunications services in the field of education, and the potential of telecommunications as a substitute for face-to-face business meetings.

Spann, Robert M., "Rate of Return Regulation and Efficiency in Production: An Empirical Test of the Averch-Johnson Thesis," The Bell Journal of Economics & Management Science, Spring 1974, pp. 38-52.

Tests the Averch-Johnson thesis using the trans-log production function. The test is applied to data from regulated electric utilities and confirms the Averch-Johnson thesis.

Study of International Telecommunications Policies, Technology, and Economics, Stanford Research Institute, Menlo Park, Calif., May 1966, 209p.

This study consists of the main document, as well as supplements and appendices. Chapters in the main document cover summary and conclusions, policy considerations, description of the U.S. international telecommunications industry, survey of existing and planned facilities, revenue and financial history of the industry, summary of future progress of technology, economic forecasts, global communications network status, trends, analysis of key problems, and assessment of organizational alternatives.

Technology Requirements for Communication Satellites in the 1980's; Final Report, Lockheed Missiles and Space Co., Sunnyvale, Calif., October 1973, NTIS no. N74-17567.

Defines key technology requirements for meeting forecasted demands for communication satellite services in the 1985-1995 time frame. Evaluates needs for services and technology and functional requirements for providing services, and forecasts future growth capabilities of terrestrial telephone network, cable TV, and satellite networks.

Technology Requirements for Post-1985 Communications Satellites; Summary Report, Lockheed Missiles and Space Co., Sunnyvale, Calif., September 1973, NTIS no. N74-16888.

Discusses technical and functional requirements for commercial communications satellites and emphasizes the need for providing quality service at acceptable cost. Specialized services are postulated in a needs model which forecasts future demands. This needs model is based upon 322 separately identified needs for long distance communications.

Verguese, D. & Doret, P., "Across the Atlantic; Cables versus Satellites", transl. into English from Le Monde, Paris, France, December 1971, pp. 18-19, (avail. NTIS).

Examines comparative cost estimates and use forecasts of transcontinental communication by satellites versus cables.

Wheatley, N., "The Planning and Commissioning of a Communications Satellite Earth Station and Its Integration with Existing Telecommunications Systems", The Radio and Electronic Engineer, November 1970, pp. 241-254.

Considerations for on-site planning are discussed in the context of the construction of the earth station at Bahrain, Arabian Gulf in 1969. The relationship of other wideband systems in the Gulf is described, along with the resultant growth of traffic in an area where the demand had been suppressed due to the limitations of narrow-band high-frequency outlets.

Winston, Donald C., "Maritime Satellite Customers Sought", Aviation Week and Space Technology, April 15, 1974, pp. 38-39.

Reports on the "information and education" sessions held in Europe by Comsat General Corp., aimed at acquiring commercial traffic for the maritime communications system; describes the communications system.

Yatrakis, Pan George, "Determinants of the Demand for International Telecommunications", Telecommunication Journal, December 1972, pp. 732-746.

Examines the role of economic,demographic, cultural and geographic factors in determining aggregate national demand for international telecommunications services; theory of demand is developed.

U.S. International Communications Industry, cont'd.

e) Industry Structure

Borchardt, Kurt, Structure and Performance of the US Communications Industry, Harvard Press, Boston, 1970, 180p.

Concerns evaluating and managing the structural problems of the communications industry that result from the interaction of public regulation and rapidly changing technology. Suggests modifications in regulatory procedures to ensure efficient industry in environment of new technologies and growing demands for increasingly diverse services.

Comsat--The First Ten Years; Report to the President and the Congress, 1973.

Report includes chapters on expanding global satellite services, satellites for the global system, earth stations for the global system, corporate matters, Intelsat organization, research and development, financial review.

Demaree, Alan L., "The Age of Anxiety at AT&T", Fortune, May 1970, pp. 156+.

Discusses some of the corporate organization and problems of AT&T: the "balancing act" between service and profits, the blend of independence and conformity in the operating companies, forecasting and personnel problems, equipment competition and others.

Emerine, R.J., et al., A Planning Study for an Investigation of Corporate Structures in the Telecommunications Common Carrier Industry, Abt Associates, Inc., Cambridge, Mass., 1974, 259p.

Study is result of FCC's interest in the implications of vertical integration and holding company structure of common carrier firms. Contains chapters on industry description, price analysis, rate of return analysis, economic theory, effects of monopoly, effects of regulation, effects of vertical integration, effects of corporate structure on innovation: evidence & analysis, policy recommendations, and recommendations for future work.

"ITT System Principal Divisions and Subsidiaries", Electrical Communication, Vol. 47, No. 4, 1972, pp. 308-311.

Gives a country-by-country listing of ITT divisions and subsidiaries in manufacturing, sales and service, and gives an alphabetical listing of its worldwide business and consumer services, international communications operations, and interests (50% and minority).

"ITT: The View From Inside", Business Week, November 3, 1973, pp. 42-63.

Reports in detail on the corporate structure of ITT - how it is run, and some of the problems it has encountered, as well as presenting a look at the executive chairman, Harold Geneen. Also reports on nine of the ITT-managed companies: Sheraton Corp., Standard Telephones and Cables Ltd., Hartford Fire Insurance Co., Cannon Electric Co., PGS Corp., Levitt and Sons, Groko, Standard Elektrik Lorenz AG, and H.M. Harper Co.

"The Management Style of John de Butts", Harvard Business Review, January-February 1974, pp. 34+.

Interviews the chairman of the board of AT&T to determine his management style - how he runs a business organization as large as AT&T.

Martin, Neil A., "Pie in the Sky? Regulatory, Political Uncertainities Are Besetting Comsat", Barrons, March 20, 1972, pp. 9+.

Gives a businessman's view of Comsat as a business enterprise: reports on Comsat's favorable image, following President Nixon's live televised visit to the People's Republic of China. It then goes into further detail on Comsat's problems: reduced growth, FCC rate regulation, its role in the domestic satellite market, a question of ill management, its role in management.

McCormack, J., "Putting Communications Satellites to Commercial Use", Signal, vol. 24, 1970, p. 40+.

Deals with commercial satellite communications, discussing creation and objectives of Comsat and establishment of Intelsat.

Nicholas, R.T., Submarine Telephone Cables and International Telecommunications, The Rand Corp., Santa Monica, Calif., 1963.

Relatively speaking, this is a rather old document, but considering the fact that almost every current article is about communications satellites, this document will be noted despite its age. Contents include: capacity and investment in submarine telephone cable systems, alternatives to submarine telephone cables (other than communications satellites), demand for submarine cable service, appendices on submarine telephone cable chronology, capacity of submarine telephone cables, and submarine telephone cable costs.

"The Other Side of the (ITT) Coin," Forbes, June 15, 1974, pp. 27-28.

Gives an overview of ITT's telecommunications equipment sales in Western Europe and prospects for growth.

Report and Recommendations to the Senate and House Commerce Committees, Intergovernmental Committee on International Telecommunications, Govt. Printing Office, April 1966, 33p.

Presents brief overview of international telecommunications, with sections on present industry structure, national policy, performance and trends, problems, performance under alternative structures, and recommendations.

Silverman, P.B., International Communications - An Overview, RCA INC., Western Electric Show and Convention, New York, 1972.

Examines the international communications business, fraught with operational, technical and political problems that must be solved if an international record carrier is to provide subscribers with a wide range of viable communication service offerings. Reviews the problems associated with the development of a typical international leased channel network, showing the magnitude of the typical problems encountered and the methodology employed to solve them.

Stanley, Kenneth B., "International Telecommunications Industry: Interdependence of Market Structure and Performance Under Regulation", Land Economics, November 1973, pp. 391-403.

U.S. International Communications Industry, cont'd.

Studies the different aspects of the international telecommunications industry market structure, especially as it is affected by regulation. Examines investment bahavior of Comsat and AT&T, pricing policies and market structure, and gives suggestions to improve industry performance.

Strassburg, Bernard, "New Technology and Old Institutions," Telecommunications, June 1974, pp. 23-25.

Views the regulatory framework for established domestic communications that has been used by FCC for satellite communications as well.

Uhl, Edward G., "Evolution of a Satellite Communications Business," Telecommunications, August 1974, pp. 49-52.

Views growth and development of satellite communications industry in U.S., both domestic and international applications.

(f) Rates and Tariffs

Cole, J.E., Arnaud, G.W., Adams, L.H., and Fackelman, M.P., U.S. International Telecommunication Rate History, U.S. Department of Commerce, Office of Telecommunications, November 1975 (updated from December 1973), 196 p.

Gives a brief outline of major developments in U.S. international telecommunications and the establishment of rates, then presents rate history broken down into international telephone carrier rates, international record carrier rates, COMSAT rates, and INTELSAT rates.

CHAPTER THREE

Non-U.S. Telecommunications Systems and Programs

This section refers the reader to a wide sampling of communication programs outside the U.S. Not all of the programs cited have international applications. Systems and programs involving U.S. support or participation may be mentioned here or included elsewhere, particularly in chapters (2) U.S. Communications Industry, and (7) International Financial and Technical Cooperation.

Burchhardt, P.L., Prospectus for a European Company with Regard to the Operation of Regional Application Satellite Systems, paper presented at the 4th Eurospace US-European Conference, Venice, Italy, September 22-25, 1970, 9 p. (avail. NTIS).

Discusses European aerospace and electronic equipment, and industrial cooperation for air traffic control and communication satellites.

Chapman, J.H., Canadian Interests and Activities in Space Communications and Navigation, paper presented at the American Astronautical Society's 19th Annual Meeting, Dallas, Texas, June 19-21, 1973, 16 p.

Discusses Canadian space programs in communications, navigation and atmospheric science, considering telephony, data transmission, TV broadcasting & remote sensing.

"China in a New Era," Far East Trade and Development, Vol. 29, no. 10/12, 1973, pp. 258-279.

Reports on China's economic conditions, foreign trade, industry, telecommunications and transportation.

Contzen, J.P., "Broadcasting Satellites in Europe," Telecommunications, May 1975, pp. 31-32.

Addresses role of satellite communications in social, geographic and cultural issues, within European context.

Dawidziuk, B.M., International Communications In South East Asia and West Pacific, paper presented at STC Submarine Cable System - Symposium, Singapore, Feb. 18-20, 1974.

Explores international telecommunications environment in South East Asia and the West Pacific.

Egbe, Emmanuel, "Telecommunications in Cameroon," Telecommunication Journal, October 1974, pp. 596-607.

Describes the telecommunications development plan of Cameroon, with a look at telephone service, telegraph and telex service, broadcasting, and aeronautical telecommunications.

Gordon, Lorna, "The Jamaica Broadcasting Corporation Geared to Serve a Developing Nation," European Broadcasting Union Review, May 1972, pp. 25-27.

Reports on television broadcasting in Jamaica by the Jamaica Broadcasting Corp.: administration, transmission problems, development, satellite broadcasting, programming.

Hansen, Georges & Griffiths, Eric, "World-Wide Television," Journal of the Society of Motion Picture and Television Engineers, June 1971, pp. 459-464.

Reviews the development of international television and describes the methods used by the European Broadcasting Union for the organization of international television transmissions.

Hartbaum, H.K., "The Applications Satellite Program - A Challenge to the European Communications Industry," A Journal of the British Interplanetary Society, March 1974, pp. 177-186.

Discusses Comsat program, European space programs, international cooperation, ESRO, policies, regulations, R&D.

Hobbs, Marvin, "Growth in International Communications and DDD," Telephony, April 7, 1975, pp. 32f.f.

Examines international direct distance dialing in several selected countries: Federal Republic of Germany, U.S., Sweden, U.K., Japan, and Australia. Also studies two of the important factors in IDDD - switching and signaling.

Hume, C.R., "Communications Satellites and the International Communications Industry," Journal of the British Interplanetary Society, February 1973, pp. 65-76.

Discusses government/industry relations, aircraft communication, communication cables, international cooperation, submarine cables, transoceanic communication.

IEEE Transactions on Communications, Sept. 1974, pp. 1447-1498.

Contains several articles on telecommunications research and developments in Switzerland, Israel, Federal Republic of Germany, Greece, Italy, Finland, France, Romania, and Sweden.

Indian National Committee for Space Research (INCOSPAR), paper presented at the COSPAR 14th Plenary Meeting, Seattle, Wash., June 18-July 2, 1971.

Presents the Indian report to COSPAR on space activities, discussing organization, facilities, experiments, applications, international collaboration and future plans.

Instant World, A Report on Telecommunications in Canada, Dept. of Communications, Canada, 1971.

Discusses "electronic snooping," computers for banking, data banks and privacy, cable, domestic distribution and direct broadcast satellites. Analyzes present Canadian telecommunications services - who provides what services, regulation of services, communications interface between Canada and the rest of the world through the COTC.

Jamison, M., Leme, M.J. & Suppes, P., Software Production for the Brazilian Advanced Educational Technology System (AETS/SACI), paper presented at the AIAA 3rd Communications Satellite Systems Conference, Los Angeles, Calif., April 6-8, 1970, 10 p.

Examines software production for Brazilian Advanced Educational Technology System.

Jankovich, J.L., "Are Satellites Really Needed for European Education?", Spaceflight, Aug. 1973, pp. 315-319.

Examines Western European Space policy mass media and educational technology.

Kurokawa, Jiro, "Enactment of the Cable Television Broadcasting Law in Japan," European Broadcasting Union Review, Sept. 1972, pp. 47-50.

Outlines the contents and significance of the Cable Television Broadcasting Law, the purpose of which is to "assure proper regulation of the establishment of cable television systems and operation of cable television services by making establishment of cable television broadcasting systems subject to the issuing of a permit by the Minister of Posts and Telecommunications.

La Vean, Gilbert & Edward Martin, "Communication Satellites: The Second Decade," Astronautics and Aeronautics, April 1974, pp. 54-60.

Discusses latest trends in space telecommunications: ITU projects; Intelsat system; Canadian Telesat system; U.S. domestic systems; projects by Comsat/AT&T, Western Union, American Satellite Corp., General Telephone & Electronics, RCA Globcom, and CML; military systems; Russian Molniya system; mobile systems; technology trends.

MacNaughton, J.D., Role of Industry in a Canadian Space Program, paper presented at the Canadian Aeronautics & Space Institute and American Institute of Aeronautics & Astronautics, Meeting on Space - 1972 Assessment, Ottawa, Canada, July 10, 11, 1972, 8 p.

Studies aerospace industry, government/industry relations, international cooperation, space programs, technology utilization.

Maddox, B., "A Brazilian Satellite - For What --- Educational Television Service," New Scientist, April 25, 1974, pp. 178-179.

Discusses ATS, satellite television, international cooperation, educational television.

Maddox, B., "Mendonia's Dream of Brazil in Space --- Space Program Implementation," New Scientist, April 18, 1974, pp. 114-115.

Deals with communication satellites, remote sensors, international cooperation, research projects, satellite networks.

Madgwick, Robert, "Forty Years of the Australian Broadcasting Commission," European Broadcasting Union Review, Sept. 1972, pp. 24-26.

Discussing the Broadcasting & Television Act which places the responsibility for programs and program policy on the Commission. Also looks at future technological developments and comments on the question of importing television programs.

Management of the Space Segment of Application Satellite Systems, Eurosat S.A., Geneva, Switzerland, 1973, 32 p., (avail. NTIS).

Discusses European space programs, management methods, mission planning, project management, financial management, international cooperation.

National Report of Space Research and Space Activities in Indonesia, paper presented at the COSPAR 13th Plenary Meeting, Leningrad, USSR, May 20-29, 1970, 12 p.

Presents report to COSPAR on Indonesia space research including TV broadcasts through Intelsat 3 satellite, sounding rocket research, atmospheric physics, etc.

National Research Council of Canada, Canadian Committee on Space Research Report to COSPAR - May 1970, paper presented at the COSPAR 13th Plenary Meeting, Leningrad, USSR, May 20-29, 1970, 69 p.

Presents report to COSPAR on space research in Canada, covering Alouette satellites, ISIS-I, international cooperation, etc.

Ninth Annual Report of the Indian National Committee for Space Research (1st April 1969-March 1970), paper presented at the COSPAR 13th Plenary Meeting, Leningrad, USSR, May 20-29, 1970, 37 p.

Presents report to COSPAR on Indian space research describing organizational structure, facilities, experiments and international cooperation.

"The Piero Fanti Space Communications Station," Italy, Documents and Notes, Vol. 21, July-August 1972, pp. 313-320.

Discusses Italian participation in international satellite communications activity.

Pipe, Russell, Towards Central Government Computer Policies, Data Base Developments and International Dimensions, 1973, 215 p.

Outlines data base policy issues, establishing computer utilization policies by central governments, analysis of patterns of data base policy development, formation of international and supra-national computer linkage systems.

Ploman, Edward; Pierce, William & Lorfs, Jaques, South America, Preparatory Study of the Use of Satellite Communication for Education and National Development, UNESCO, Paris, May 1970.

Examines the social and educational status and related problems of Argentina, Uruguay, Chile, Peru, Ecuador, Colombia, and Venezuela. These findings are then considered in light of the broadcast and telecommunication developments within these countries to date, to determine the feasibility of adopting individual satellite systems to meet the social and educational needs of each country.

Robins, W.P., "Communication Via Geostationary Satellites - The Proposed European System," Telecommunications, April 1974, pp. 33-39.

Examines satellite communication systems in terms of up-link power budgets, bandwidth considerations, frequency reuse, and how existing technology can be applied to proposed European satellite system.

The Second Fifteen Years in Space; Proceedings of the Eleventh Goddard Memorial Symposium, Washington, D.C., March 8, 9, 1973, American Astronautical Society, Lauzana, Calif., 1973.

Includes such papers as: "An International Outlook of the Second Fifteen Years in Space" by A.H. Abdel-Ghani (p. 185-193) and "Review of European Space Projects after 1980" by M. Levy (pp. 177-184).

Simmons, N., "The British National Space Programme," Spaceflight, Vol. 13, 1970, pp. 6-11.

Looks at UK space program, discussing international cooperation, sounding rocket development and performance, and military communication satellites.

Space Research Activity in Italy, paper presented at the COSPAR 14th Plenary Meeting, Seattle, Wash., June 18-July 2, 1971.

Presents Italian Report to COSPAR 1970 space research, discussing 1971-72 programs for cosmic radiation, space plasma, meteorology, communications and international cooperation.

Spintig, J., "Ariane - The New European Launcher -- For Applications Satellites Emplacement into Geostationary Oribts," Dormier-Post, No. 2, 1974, pp. 44-45.

Deals with European space programs, rocket launchers, rocket engine design, stationary orbits, synchronous satellites.

Talyzin, N.V. and Kantor, C.Y., "The Mobile Soviet Earth Station 'Mars': Some Practical Results," Telecommunication Journal, Vol. 42, May 1975.

Discusses design features and concepts behind Soviet's newly designed mobile earth station Mars, designed to operate with satellites on both geostationary and elliptical orbits.

Telecommunications Research in the United States and Selected Foreign Countries: A Preliminary Survey, Vol. I, Summary, National Academy of Engineering, Washington, D.C., Committee on Telecommunications, June 1973, NTIS no. PB-222 081/2.

Provides overview of total study and detailed results on some aspects. Topics include: status and trends of telecommunications research in the U.S. and selected foreign countries, summary conclusions of the telecommunications research panel, summary and recommendations of Communication Technology for Urban Improvement.

Wangermee, Robert, "Towards Modern Management in Broadcasting," European Broadcasting Union Review, Nov. 1972, pp. 30-38.

Reports on the May 1972 EBU colloquy held in Brussels on the theme of modern management in radio and television. Summarizes the following discussions conducted in the colloquy: principles of modern management and specificity of broadcasting, structures, financial organization, internal information, personnel.

White, Graham, "Rural Broadcasting in Australia," European Broadcasting Union Review, May 1972, pp. 19-24.

Reports on Australian radio and television broadcasting to rural areas: describes rural staff and audience, radio programs for farmers and urban/rural audiences, and rural television programs.

CHAPTER FOUR

Telecommunications Technology

The most technical articles of the bibliography are included here. Various telecommunication technologies are explored in detail in articles that are cited; other articles provide basic overviews of technical aspects of telecommunications systems. A Technical Addenda appears at the end of the section. It is a continuation of Chapter (4) and constitutes the most recent update of telecommunications technology sources (whereas updated articles for other subjects were consolidated within the appropriate chapters).

Telecommunications Technology, cont'd.

Adelaar, H.H., et. al., "Implementation of CCITT No. 6 Common-Channel Signaling in the Metaconta System," Electrical Communication, Vol. 46, No. 2, 1971, pp. 100-113.

ITT contributions to the development and specification of the signaling system are highlighted and the new possibilities the system may provide are indicated. Describes the general organization and specific features of the software package for handling the No. 6 System messages, followed by a general block diagram and functional description, showing how the system interfaces with a Metaconta processor-controlled exchange.

Allaway, H.G. & Lynch, J., Telesat-A; Press Kit, NASA, Washington, D.C., 1972, p. 11.

Examines synchronous communications Telesat-A characteristics, launching by Delta 29, and flight plans.

Arnold, Richard C., "Telecommunications with Muon Beams," Science, July 14, 1972, pp. 163+.

Reports on the possible use of well-collimated beams of muons with energies in the range of 10^9 electron volts which may be suited to some particular needs in telecommunications, including long distance communications systems.

Astholz, P.L., "Oceanic Aeronautical Satellite Systems," IEEE Transactions on Communications, May 1973, pp. 493-500.

Reviews oceanic ATC by application of aeronautical satellite technology, discussing system design requirements, performance evaluation and international program.

"The 'ATS-6' Satellite," Telecommunication Journal, October 1974, pp. 588-594.

Gives overview of ATS-6 projects: health education telecommunications, experiments in satellite instructional television, tracking and data relay, radio frequency interference, milimeter-wave propagation, and L-band experiment. Gives a description of the major components of the ATS-6 spacecraft.

Badalov, A.L. & Barodich, S.V., "The Efficient Utilization of the Geostationary Orbit by Communication Satellites," Radiotekhnikor (translation-Telecommunications, and Radio Engineering), Part 2, November 1971, pp. 64-67.

Reviews frequency allocation effectiveness and mutual interference calculation for adjacent geostationary communications satellite.

Baker, James P., "Message Switch for Western Union International," Telecommunications, October 1970, pp. 46-47.

Describes WUI's new store-and-foreward message-switching system.

Ball, H.K. & Mondre, E., "The Modular Repeater of the European Communications Satellite (ECS) and the Orbited Test Satellite (OTS) - A Demonstration of European Collaboration in Space Applications," Journal of the British Interplanetary Society, May 1974, pp. 328-336.

Discusses electronic modules, European space programs, international cooperation, multichannel communication, repeaters, frequency assignments, satellite design and transmission.

Bargellini, P.L., ed., Communications Satellite Systems, AIAA, Vol. 32, 1974, 480 p.

This is a selection of technical papers presented at the AIAA 4th Communications Satellite Systems Conference held in April 1972. The papers are organized under the following headings: international applications, advanced concepts, and special topics.

Bargellini, P.L., ed., Communications Satellite Technology, AIAA, Vol. 33, 1974, 540 p.

This is the second volume of selected technical papers presented at the AIAA 4th Communications Satellite Systems Conference held in April 1972. The papers are organized under the following headings: orbit and attitude control, propulsion and power, and communications.

Bargellini, P.L., ed., "The INTELSAT IV Communications System," COMSAT Technical Review, Spring 1972, pp. 437-572.

Presents various aspects of INTELSAT communications system. Following an outline of possible system approaches, transponder configurations and characteristics, earth stations, transmission analyses and simulations, field tests, and operational procedures are described.

Telecommunications Technology, cont'd.

Bargellini, Pier L., "Satellite Communications," Telephone Engineer and Management, December 15, 1971, pp. 44-49.

Last of a six-part series, this article looks into new technological developments for future satellites: new bandwidth allocations, communications subsystems advances, PCM and other digital systems, new satellite services.

Barstow, J.M., & Campanella, S.J., "Geostationary Satellite Telephone Circuit Transmission Quality," Telecommunication Journal, February 1973, pp. 83-87.

Reviews acceptability of telephone service over very long-distance connections including satellite links, in-service tests to differential between qualities of connections via satellite and those via terrestrial circuits; results reported from intercontinental connections having 2 satellite links in tandem. Possibilities of satellite link involving satellite-to-satellite and satellite-to-earth circuit sections are explored and technical feasibility is shown.

Bayless, J.W., Campanella, S.J., & Goldberg, A.J., "Voice Signals: Bit-by-Bit," IEEE Spectrum, October 1973, pp. 28-34.

Examines the use of digital coding as a way to improve voice communications - they are relatively insensitive to noise, crosstalk, and distortion, and faded signals can be readily regenerated. Approaches to encoding and decoding conversion problem are waveform digitization and vocoder methods.

Bedrosian, E., Data Relay from Emplacer Sensor Fields: An Illustrative Design for a Burst-Mode System Using a Communication Satellite, Rand Corporation Paper, R-667-PR, July 1971.

Examines feasibility of using satellite relay to handle data transmitted by a sensor field.

"Bell Labs Makes a 'Switchless' Switch," Business Week, June 10, 1972, 24 p.

Describes the No. 4 ESS (electronic switching system) which, used with digital transmission lines, will take only one tenth of the space now required by electro-mechanical equipment while doing ten times the work.

The Bell System Technical Journal, May-June 1970, pp. 601-798.

This entire issue is devoted to articles on the SF submarine cable system. Titles of articles include: "An Overview: Requirements and Performance," "Repeater and Equalizer Design," "Manufacture of Submarine Cable Repeaters and Ocean Block Equalizers," "Transistors, Diodes and Components," "Ocean Cable and Couplings," "Shore Terminal Facilities and Fault Location," "Power Conversion," "Submarine Cable Route Engineering," "Transmission Tests, Computation and Equalization During Installation."

Bernard, J.J., "CCITT International Signalling System No. 6," Telecommunication Journal, February 1974, pp. 69-76.

Explains and recommends use of Signalling System No. 6 in international telephony, as well as provides general information about signalling and international signalling systems.

Blachier, B.L., "European Participation in the Definition of The Next Generation Satellite," Journal of the British Interplanetary Society, May 1974, pp. 337-342.

Telecommunications Technology, cont'd.

Discusses European space programs, Intelsat, international cooperation, satellite design, microwave transmission, multichannel communication.

Blachier, B., Fere, P., & Koenig, W.A., An 11-13 GHz Satellite Communications Repeater, paper presented at the AIAA 4th Communications Satellite Systems Conference, Washington, D.C., April 24-26, 1972, p. 13.

Discusses repeaters, satellite antennas, spacecraft communication, antenna radiation patterns, international cooperation, parabolic reflectors, traveling wave tubes.

Bolger, P.H., Global Rescue Alarm Network - A Location and Warning System, paper presented at the International Astronautical Federation's 23rd International Congress, Vienna, Austria, October 8-15, 1972, 22 p.

Studies satellite relay and omega navigation system for distress signal transmission and reception in global rescue alarm network serving ships, aircraft, and spacecraft.

Briskman, Robert, "Possible Applications of Communications Satellites to Offshore Systems," IEEE Transactions on Aerospace and Electronic Systems, September 1970, pp. 612-619.

Presents the capabilities of communications satellites both as currently existing and as envisioned in the future. Reports on the progress in development of a small earth station of low cost suitable for offshore services.

Telecommunications Technology, cont'd.

Brown, A., "Direct Satellite Broadcasting; FM Television Co-Channel Protection Ratio and Sound Subcarrier Parameters," European Broadcasting Union Review (Technical), December 1972, pp. 262-268.

Discusses some of the parameters of an FM system suitable for direct television broadcasting from a geostationary satellite. Presents the results of subjective tests on co-channel interference and derives a formula relating protection ratio to picture impairment scale.

Busignies, Henri, "Communication Channels," Scientific American, September 1972, pp. 99-113.

Includes a brief description of optical-fiber transmission - how it works and its potential applicability in the future.

Cacciamani, Eugene R., "The SPADE System as Applied to Data Communications and Small Earth Station Operation," COMSAT Technical Review, Fall 1971, pp. 171-182.

Special applications of the SPADE system and its flexibility have made consideration of small earth station terminal networks particularly attractive. Trade-offs which consider earth station antenna size, service requirements, channel coding requirements, and available satellite transponder e.i.r.p. are evaluated, and typical configurations that can be implemented as a direct result of current experimental studies are presented.

Campanella, S.J., & Sciulli, J.A., "A Comparison of Voice Communications Techniques for Aeronautical and Marine Applications," COMSAT Technical Review, Spring 1972, pp. 173-204.

Makes a comparative analysis of several voice modulation techniques which are candidates for aeronautical and marine satellite applications.

Campanella, S.J., Suyderhoud, H.G. & Onufry, M., "Analysis of an Adaptive Impulse Response Echo Canceller," Comsat Technical Review, Spring 1972, pp. 1-38.

Describes design and performance of echo cancelling device which eliminates dichotomy and enhances quality of satellite communications.

Carassa, F., Drufuca, G., & Paraboni, A., The Station Satellite SIRIO-SHF Propagation & Communication Experiments - Scientific Objective & Organization of the Experiments, paper presented at the AIAA 3rd Communications Satellite Systems Conference, Los Angeles, Calif., April 6-8, 1970, 18 p.

Looks at Station SIRIO project, describing SHF propaqation and communication, cosmic ray and confined plasma experiments.

Coburn, Alan R., "Satellite Communications," Telephone Engineer and Management, September 15, 1971, pp. 42-47.

Third of a six-part series, this article discusses the factors involved in earth station technology: improving the stations, locating earth station sites, costs, and trends, unmanned stations.

Collins, Arthur A., & Pedersen, Robert D., Telecommunications; A Time for Innovation, Merle Collines Foundation, Dallas, Texas, 1973.

178 page book on new technical developments in switching network structures, switch design studies, digital connecting character of traffic and telecommunication services, call processing and system control.

Communications Technology Satellite, Communications Research Centre, Ottawa, Canada, 1973, 16 p., (avail. NTIS).

Examines features and planned experiments of communications technology satellite.

"Comsat Silences Telephone Echoes," Electronics, May 8, 1972, p. 31.

Describes a new digital processing scheme developed by Comsat Laboratories which not only suppresses echoes, but cancels them without weakening the voice signals.

Comsat Technical Review, Fall 1972.

This entire issue is devoted to articles on the various aspects of the Intelsat IV satellites. The articles are entitled: "The Intelsat IV Spacecraft," "Launch and Orbital Injection of Intelsat IV Satellites," and "The Intelsat IV Communications System."

Cook, J.S., "Communication by Optical Fiber," Scientific American, November 1973, pp. 28-35.

Gives a detailed description of optical fiber transmission - how it works and problems associated with it.

Covault, Craig, "Major Advances Expected from ATS-F," Aviation Week and Space Technology, May 27, 1974, pp. 38-42.

Looks at NASA's final and most poweful communications satellite.

Telecommunications Technology, cont'd.

Crew, G.L., CCITT Signalling System No. 6 Field, Project Review, Australian Post Office Research Labs., Melbourne, Australia, 1970, 42 p., (avail. NTIS).

Discusses equipment and software for common channel international telephone and telemetry system field trails.

Deschuytere, L.C., et. al., "International Multiplex Equipments," Electrical Communication, Vol. 66, No. 1, 1971, pp. 4-23.

Discusses a new generation of international multiplex equipment, which has been designed based on ITT marketing experience in many countries. The equipments cover channel, group and supergroup carrier equipment systems up to 2700 telephone channels.

"Digiplex Stuffs More Data into Submarine Cables," Electronics, September 13, 1971, pp. 171-172.

Describes digiplex system, which has smaller and less expensive terminal equipment than rectiplex, but can transmit almost twice as many Teletype signals. Favorably compares this new system with rectiplex in its increased information-carrying capacity and channel efficiency.

Dinkespiler, J.A., "Advanced Air Traffic Control Systems," in International Cooperation in Space Operations and Exploration; Proceedings of the Ninth Goddard Memorial Symposium, Washington, D.C., March 10, 11, 1971, American Astronautical Society, 1971, pp. 77-82.

Deals with aircraft communication, data transmission, ground stations, international cooperation.

Telecommunications Technology, cont'd.

Dwyre, D.G., The IDCSP/A Satellite-Concept & Performance, paper presented at the AIAA 3rd Communications Satellite Systems Conference, Los Angeles, Calif., April 6-8, 1970, 9 p.

Studies initial defense communication satellite program/augmentation satellite design and mission, onboard communications equipment, control subsystems, American-British cooperation, etc.

Edelson, Burton I., & Werth, Andrew M., "SPADE System Progress and Application," COMSAT Technical Review, Spring 1972, pp. 221-242.

Describes the SPADE system operation and looks at its future applications: to encourage the establishment of new satellite links, as well as to increase traffic over existing links. The techniques developed in the SPADE system may have important future applications to telegraphy and data transmission, to small earth stations, and to new multidestinational services.

Edelson, B.I., "Technological Trends in Commercial Satellite Communications," Spaceflight, August 1973, pp. 282-287.

Discusses Comsat, Intelsat, technological innovations.

European Communication Satellite (ECS) TV Adapatation Study, 3 volumes, British Aircraft Corp. Ltd., Bristol, U.K., 1972, 531 p., (avail. NTIS).

Volumes include a summary, and sections dealing with community and individual TV broadcast satellites noting antennas, repeaters, attitude and thermal control, powers system and configurations.

Falk, Howard, "Communications and Microwaves," IEEE Spectrum, January 1974, pp. 32-36.

Studies the ever-increasing demands for transmission bandwidth pressing communications technology towards light-frequencies. Communication engineers are working to provide new technology needed to supply transmission bandwidth needs of the future.

Feldman, Nathaniel E., & Kelly, Charles M., Communication Satellites for the 70's: Systems, AIAA, MIT Press, Vol. 27, 1971, 653 p.

This is a selection of technical papers presented at the AIAA 3rd Communications Satellite Systems Conference held in April 1970. The papers are organized under the following headings: spacecraft antennas, high-power transmission, integration and testing, launch vehicles, digital techniques, and earth stations.

Feldman, N.E., & Kelly, C.M., "The Communication Satellite - A Perspective for the 1970's," Astronautics & Aeronautics, Vol. 9 (1971), pp. 22-29.

Looks at broadband point-to-point communication satellite systems for the 1970's, discussing R&D effort, economics, and international and domestic applications.

Fennessy, E., "Global Telecommunications in the Space Age," Electrotechnology (GB), January 1973, pp. 3-8.

Traces the development of communications, examines some of the present problems, and indicates how the science might develop in years to come.

Franklin, C.A., & Davison, E.H., A High-Power Communications Technology Satellite for the 12 and 14 GHz Bands, paper presented at the AIAA 4th Communications Satellite Systems Conference, Washington, D.C., April 24-26, 1972, 21 p.

Studies the Canada-NASA Communications Technology Satellite (CTS) for 12 and 14 GHz TV transmission, considering mission profile, spacecraft design, attitude control system and ion thustor.

Fuenzalida, J.C., & Chitre, N.K.M., "Frequency-Sharing Considerations Between Geostationary Communication Satellites and Terrestrial Radio Relays," Comsat Technical Review, Fall 1971, pp. 45-77.

Satellite interference into terrestrial radio relay is controlled by limiting power flux-density caused by each satellite at the surface of the earth. This limit can be increased both with frequency and with angle of arrival above horizon. Terrestrial radio-relay interference into a satellite is controlled by limiting both transmitter power and e.i.r.p. of the radio relay.

Golding, L.S., & Ball, J.E.D., "Satellite Television Covers the World," IFFE Spectrum, August 1973, pp. 24-31.

Discusses power limitations on satellites, television quality objectives, standards systems and impairments.

Grisdale, G.L., "Communication With Ships and Aircraft Through Satellites," Point-to-Point Communications, May 1972, pp. 64-72.

Outlines technical problems in establishing systems to provide communications and position-finding for ships and aircraft.

Hanson, C.W., & Brown, J.V., Attitude Determination for the Skynet and NATO Synchronous Communications Satellite, paper presented at the AIAA, 4th Communications Satellite Systems Conference, Washington, D.C., April 24-26, 1972, 10 p.

Describes attitude determination during transfer orbit operation of Skynet & NATO synchronous communications satellites. Discusses computer techniques, guidance sensors, injection guidance, international cooperation, spin stabilization.

Hart, J.L., Johnson, E.W., & Pappas, D.G., Communications in the Military Assistance (MAP), Research Analysis Corp., McLean, Va., 1971, 148 p., (avail. NTIS).

Discusses communication equipment, education, military technology, international cooperation, technology transfer.

Herter, E., & Kupp, H., German TDMA System: I - System Description, paper presented at the 11th European Space Symposium, West Berlin, May 24-26, 1971.

Examines German TDMA system based on satellite repeater, discussing network configuration, transmission parameters, control, frame/burst format and field trail.

Hughes, C.D., "Receiver Terminals for Satellite Television Systems," in Conference on Radio Receivers and Associated Systems, Swanson, Wales, July 4-6, 1972, Proceedings, Institution of Electronic and Radio Engineers, 1972, pp. 353-360.

Discusses ground stations, video communication, educational television, international cooperation, superhigh frequencies, wideband communication.

Hult, J., Spectrum for Area Coverage from Satellite Relays to Small Terminals, Rand Corp. Paper, Santa Monica, Calif., 1970, 10 p.

"Between 500 and 750 MHz of spectrum bandwidth can be shared with currently allocated use of this spectrum to provide satellite downlinks for small mobile and broadcast terminals without harming or limiting any operations in the portion of the spectrum from 540 to 1215 MHz."

International Conference on Numerical Telecommunications by Satellite, 2nd, Paris, France, November 28-30, 1972, Proceedings, Societe des Electriciens, des Electroniciens et des Radioelectriciens and Organisation Internationale des Telecommunications par Satellite, Paris, France, 1972, 468 p.

Deals with digital systems, pulse communication, satellite transmission, European space programs, Intelsat, international cooperation, multichannel communication, phase shift keying, satellite television, signal encoding, time division multiplexing.

Jaynes, David W., "Analog Telephone Systems Signaling," Telecommunications International, April 1974, pp. 59-60.

Points out the problems of telephone Single Frequency Signaling Unit (SFSU) and introduces the problem-solver - the Multi Function Signaling Unit (MFSU).

Johannessen, G.H., "Signaling Systems... An International Concern," Bell Laboratories Record, January 1970, pp. 13-18.

"To join different national telephone networks into a worldwide network demands careful planning and international cooperation. Standardized signaling systems which bring international direct distance dialing one step closer to reality are examples of those efforts." Describes these efforts to standardize signaling system and gives operational details of No. 5 bis and No. 6 signaling systems.

Johnson, F.S., ed., International Congress of Space Benefits; Proceedings of the Nineteenth Annual Meeting, Dallas, Texas, June 19, 20, 1973, American Astronautical Society, Tarzana, Calif., 1974, 514 p.

Contains papers dealing with data management, international cooperation, R&D satellite television.

Johnson, G. Douglas, "No. 4 ESS - Long Distance Switching for the Future; Bell Laboratories Record, September 1973, pp. 226-232.

Describes the technical functions of the No. 4 ESS (Electronic Switching System) scheduled for commercial service in 1976. Points out "growth" procedures of the system which will enable it to keep ahead of increasing traffic.

Jowett, J.K.S., "Some Technical Problems Associated with the Use of the Geostationary Satellite Orbit," Telecommunication Journal, May 1971, pp. 301-305.

Discusses factors which may limit the ultimate use of the geostationary orbit, possible modes of interference between communication-satellites in geostationary orbit, technical factors, maximizing orbital capacity in a practical situation.

Kaiser, J., "An Experimental Ship-Shore Satellite Communications Demonstration," COMSAT Technical Review, Spring 1974, pp. 119-138.

Describes the jointly sponsored experiment in satellite communications between the Cunard ship "RMS Queen Elizabeth II" and a small earth station at COMSAT Laboratories in Clarksburg, Maryland, via the INTELSAT IV F-3 satellite over the Atlantic Ocean.

Kane, D.A., & Jeruchim, M.C., "Orbital and Frequency Sharing Between the Broadcasting Satellite Service and the Fixed-Satellite Service," in Annual International Conference on Communications, 8th, Philadelphia, Pa., June 19-21, 1972, Conference Record, IEEE, pp. 18-9 to 18-14.

Discusses frequency assignment, satellite orbits, satellite television, international cooperation, radio frequency interference, signal to noise ratios, superhigh frequencies, synchronous satellites, thermal noise.

Kirchhof, W., "The Solar Generator of the Telecommunications Satellite Symphonic," Photovoltonic Power and Its Applications in Space and on Earth; International Congress on the Sun in the Service of Man, Paris, France, July 2-6, 1973, Proceedings, pp. 417-431.

Deals with Symphonic satellites, auxiliary power sources, international cooperation, satellite design, solar energy conversion.

Klass, Philip J., "Research Hikes Satcom Efficiency," Aviation Week & Space Technology, Sept. 10, 1973, pp. 39-40.

Telecommunications Technology, cont'd.

Describes additional technological developments from the COMSAT labs: (1) a new type solar cell with 35% higher efficiency, which can be translated into a significantly longer useful orbital life for the satellite, and (2) an earth station that employs a stationary antenna to improve earth station reliability, especially as it concerns high-speed data transmission.

Klass, Philip J., "Technology Expands Satcom Capacity," Aviation Week and Space Technology, Sept. 3, 1973, pp. 54-55.

Describes two new technological developments from the COMSAT labs: (1) Digital Television Communications System, which can double the number of TV channels obtainable from a satellite transponder without perceptible picture quality degradation, and (2) Speech Predictive Encoding Communication System, which can double the number of voice channels obtainable from a satellite transponder without perceptible quality degradation for telephone users.

Knopow, J.J., & Klacksiem, J.P., "Concepts of High-Capacity Communications Satellites," in International Conference on Communications, Seattle, Washington, June 11-13, 1973, Conference Record, Vol. 1, Institute of Electrical & Electronics Engineers, N.Y. 1973, pp. 3-2 to 3-7.

Deals with satellite configurations and design, international cooperation, satellite antennas and altitude control.

Levitt, H., & Teacher, C.F., "Survey of Speech Proceeding Activity" in The 1972 Conference on Speech Communications and Process, Institute of Electrical and Electronic Engineers, N.Y., 13 p.

Surveys digital speech processing activity in the U.S. and abroad, including digital and computer techniques, speech recognition, international cooperation, signal processing, man/machine systems.

Logiadis, M.E., "Facsimile and Its Application in Global Communications," RCA Engineer, October/November 1973, pp. 22-24.

Discusses special problems associated with transmission of facsimile over long-haul voice-grade circuits, paying special attention to speed, resolution and compatibility and analyzing the cost factor based on traffic volume.

Lutz, S.G., Orbit Utilization-From Both Sides, paper presented at the AIAA 3rd Communications Satellite Systems Conference, Los Angeles, Calif., April 6-8, 1970, 7 p.

Looks at orbit utilization, discussing sharing of satellite communication frequency bands and use of multiple earthword antenna beams.

"Major Trends in Switching," Bell Laboratories Record, October 1972, pp. 270-278.

Interviews William Higgins, Vice President of the Switching Systems Area at Bell Labs in which he discusses emerging trends in electronic switching.

McKenzie, Alexander A., "What's Up in Satellites," IEEE Spectrum, May 1972, pp. 16-27.

Reports on the latest developments in the use of satellite communications in the international network and the Canadian domestic satellite system. Gives details of several proposals of a U.S. domestic satellite system and reviews the military satellite systems and experimental satellites (including ATS).

Mertens, H., & Brun, G., "Distortion of Frequency-Modulated Television Signals Transmitted by Satellite," European Broadcasting Union Review (Technical), April 1972, pp. 52-60.

Describes an investigation for the purpose of determining specifications for the passband and transfer characteristics of satellite transponder suitable for distribution of Eurovision. The developed theory makes it possible to calculate the non-linearity distortion in the video band.

Neill, Dennis V., "Satellite Communications," Telephone Engineer and Management, August 1, 1971, pp. 56-61.

Second of a six-part series, this article describes the "housekeeping" operations involved in maintaining communication satellites in orbit, including telemetry data review, tracking and ranging data processing, computation of orbits, computation of altitude, maneuver commands, switching commands, antenna despin control and spin speed maintenance.

"New Generation (NG. 1) 45 MHz Submarine Cable System," Telecommunication Journal, October 1974, pp. 585-587.

Examines technology system interfaces, line transmission characteristics and current application of a new wideband submarine cable system.

Telecommunications Technology, cont'd.

"Noise-Power-Ratio Measurements - How Accurate?," Telecommunications, March 1972, pp. 47+.

Studies problems of measuring NPR and the use of band-stop filters.

"Oceanic Communications by Ultra-Short Waves," Telecommunication Journal, January 1973, p. 15.

Reports on an oceanic repeater station which eliminates the need for submarine cables on the shallow continental shelf.

Payne, W.F., Bens, A.R., Bassett, D.A., & Lowell, R.R., Choice of an Ion Engine for the Communications Technology Satellite, paper presented at the AIAA 9th Electrical Propulsion Conference, Bethesda, Md., April 17-19, 1972, 16 p.

Studies ion thruster development for the communications technology satellite, discussing synchronous orbit station-keeping requirements, thrust sector control and mounting positions.

Ploman, Edward W., "Education in the Space Age," European Broadcasting Union Review, September 1970, pp. 19-24.

Discusses the use of satellites for education, both nationally and regionally, and provides technical background and a list of the main considerations.

Popot, M., "Satellite Communications and the Pleumen-Bodou Centre," L'Echo des Recherches, February 1972, pp. 45-51.

Deals with international cooperation, satellite networks, channel capacity, INTELSAT, multichannel communication, submarine cables.

Pritchard, Wilbur & Bargelline, Pier, "Trends in Technology for Communications Satellites," Astronautics and Aeronautics, April 1972, pp. 36-42.

Examines the technological requirements necessary for a post-1980 communications satellite to handle traffic at a 15% yearly growth rate. Examines the following techniques to be used in combination to achieve a higher communications capacity: very accurate body stabilization; more precise antenna pointing; better efficiency in energy conversion and storage, frequency reuse; and onboard switching.

Proceedings of the IEEE, February 1971, 220 p.

This entire issue is devoted to satellite communications. Articles come under the headings of systems, propagation studies, communication technology, and spacecraft technology.

Puente, J.G., & Werth, A.M., "Demand-Assigned Service for the Intelsat Global Network," IEEE Spectrum, January 1971, pp. 59-69.

Gives details of the SPADE system - the first operational demand-assignment multiple-access system planned for Intelsat IV.

Raag, Helmo, "Signalling for Satellite Systems and CCITT System No. 6 Field Trails," Telecommunication Journal, February 1974, pp. 137-139.

Describes applicability of System No. 6 to earth-satellite, satellite-earth telephone service.

Rao, B.S., & Arora, O.R., "Earth Station for Television Reception in Satellite Instructional Television Experiment (SITE)," Journal of the Institution of Electronics & Telecommunication Engineers, Aug. 1973, pp. 438-443.

Discusses ground stations, satellite television, television reception, ATS 6, economic factors, international cooperation, signal to noise ratios.

Rauschenbach, G.J., "Communications via Satellite-Dividend of the Space Age," in NASA, Marshall Space Flight Center, Space for Mankind's Benefit, 1972, pp. 265-277.

Speaks of revolutionization of communications by satellite systems.

Rosenbrock, K.H., "Experience Gained with the Common Signalling Link of CCITT Signalling System No. 6 During the Field Trails," Telecommunication Journal, February 1974, pp. 93-99.

Explains the working process and weaknesses of Signalling System No. 6.

Rugo, John J., "Checking Echo Suppressors," Bell Laboratories Record, March 1970, pp. 80-84.

Reports on a quality-control service-a new echo suppressor measuring system.

Schaible, G.J., & Durany, F., "Splicing Ocean Cable," Bell Laboratories Record, Feb. 1970, pp. 34-39.

Describes procedures involved in splicing SB, SD, and SF submarine cables.

Schenck, Herbert H., The World's Submarine Telephone Cable Systems, Washington, D.C., U.S. Department of Commerce, 1975, 290 p.

Provides detailed technical, cost and ownership information on all of the commercial underseas telephone cable systems with at least one submerged electronic amplifier (repeaters), as of late 1974. Also included are overviews of sea cable history and technology; military cables; manufacturers; and sea cables under construction, international tender, or being planned.

Schmidt, William G., "Satellite Time-Division Multiple Access Systems: Past, Present and Future," Telecommunications International, August 1973, pp. 21-24.

Looks at the experimental systems which proved the technical feasibility of Time Division Multiple Access Technology and the promise of satellite-switched TDMA, the use of which will provide low-cost satellite communications.

Scott, L.J., "Overseas Dialing: Yesterday, Today, and Tomorrow," Bell Laboratories Record, May 1970, pp. 142-149.

Describes some of the technical processes involved in making possible international direct distance dialing.

Segrue, D.F., "RCA Globcom System Diagnostic," RCA Engineer, October/November 1973, pp. 14-15.

Discusses the two types of diagnostic systems: OFF-line and ON-line, to enable operating technicians to diagnose faults rapidly and accurately.

Silverman, P.B., & Schadoff, S., "Development of International Leased-Channel Networks," RCA Engineer, October/November 1973, pp. 5-7.

Discusses the general technical problems associated with establishing an international leased channel network, reserving an international voice-grade circuit, meeting with domestic and overseas carrier representation, developing specifications for all required landlines and multiplex equipment.

"Simulating the Ocean Environment," Bell Laboratories Record, March 1971, pp. 82-88.

Describes the new hydrostatic test chamber which simulates the extreme pressures, temperatures, and tensile forces on submarine communication equipment.

Smith, G.A., & Berger, A.F., "Testing Undersea Repeaters," Bell Laboratories Record, Oct. 1972, pp. 290-294.

Describes the new crystal band test set for automatically testing undersea repeaters.

"Space Radiocommunications and Techniques," Telecommunication Journal, May 1971, pp. 234-429.

This is a summary of articles prepared for the opening of the Second World Administrative Radio Conference for Space Telecommunications. Subjects include satellite communication systems, direct broadcasting, application to mobile services, space research and radio astronomy, regulation problems, and others.

Szarvas, G.G., & Trushel, R.C., "Monitoring Interruptions of the Satellite Earth Station," COMSAT Technical Review, Spring 1973, pp. 165-181.

Describes the monitoring system which was designed and built to monitor and automatically record interruptions at the earth stations. According to the relationship of the pilots, the interruptions can be grouped as follows: satellite communications, domestic terrestrial, and distant terrestrial interruptions.

Tant, M.J., "Further Advances in Noise Power Ratio Measurements," Telecommunications International, July 1973, pp. 39-42.

Looks at the effects of band stop filter slot width on distortion measurement in moder cable, microwave link, tropospheric scatter and satellite systems.

"TASI-B; A System for Restoration and Expansion of Overseas Circuits," Bell Laboratories Record, November 1970, pp. 299-306.

Describes the operation of the TASI-B voice-frequency terminal system: how it can carry 235 simultaneous conversations on 100 conventional voice circuits and can protect cable and satellite facilities when operated at less than full capacity.

Tat, Than N'Guyen, & Girinsky, Anatole, "Evolution of Store-and-Forward Techniques," IEEE Transactions on Communications, Sept. 1974, pp. 1297-1301.

"Attempts to establish a connection between the different factors that influence the structure and procedures of the various store-and-forward systems and their ability to meet user needs."

Technology Requirements for Communication Satellite in the 1980's; Final Report, Lockheed Missiles & Space Co., Sunnyvale, Calif., October 1973, NTIS No. N74-17567.

Defines key technological requirements for meeting forecasted demands for communication satellite services in the 1985-1995 time frame. Evaluates needs for services and technology and functional requirement for providing services, and forecasts future growth capabilities of terrestrial telephone network, cable television, and satellite networks.

Telecommunications Research in the United States and Selected Foreign Countries: A Preliminary Survey, Vol. II, Individual Contributions, National Academy of Engineering, Washington, D.C., Committee on Telecommunications, June 1973. NTIS No. PB-222 082/0.

Compares telecommunications research in the U.S. with similar research in other technologically advanced countries in order to determine its adequacy, balance and relevance to U.S. national needs. Topics include the systems approach; human factors; terminals, sensors and displays; transmission, modulation/demodulation and coding; switching, routing and control, processing and storage.

Terzani, C., "Utilization of Frequency Bands Allocated to Satellite Broadcasting for Regional or Domestic Systems," in Annual International Conference on Communications, 8th, Philadelphia, Pa., June 19-21, 1972, Conference Record, (IEEE) pp. 18-1 to 18-14.

Deals with frequency assignment, satellite television, superhigh frequencies UHF, economic factors, international cooperation.

Wachs, Marvin, "Analysis of Adjacent Channel Interference in a Multicarrier FM Communication System," Comsat Technical Review, Fall 1971, pp. 139-170.

Analyzes adjacent channel interference effects to determine minimum bandwidth in multichannel, telephony, frequency modulation, transmission system. The use of proper filtering permits minimum carrier separation and hence maximum channel capacity.

Wood, H. William, & Puente, John G., "Satellite Communications," Telephone Engineer and Management, October 15, 1971, pp. 62-66.

Fourth of a six-part series, this article describes the technical management by Intelsat, as well as some new satellite technology (SPADE, digital voice compression technique, voice processing).

Wu, W.W., "Applications of Error-Coding Techniques to Satellite Communications," Comsat Technical Review, Fall 1971, pp. 183-219.

Specific applications of coding are presented which demonstrate that error coding can provide significant improvements in information transmission through satellite links.

Telecommunications Technology, Addenda

Anderson, Cleo and Gaston, Robert L., "An Overview: Requirements and Performance," Bell System Technical Journal, Vol. 49, 5, May/June 1970, pp. 605-630.

Describes considerations that led to choice of SF System design objectives and gives overview of system. Also shows performance results of TAT-5 System.

Dawidziuk, B.M. and Preston, H.F., "Comparative Evaluation of Modern Transmission Media for Global Communications," ITU Journal, Vol. 38, 2, 1971, pp. 80-91.

Compares submarine cables and satellites in providing wide band communications media, analyzes traffic, and reviews ownership, technical, operational, and economic aspects of global communications network.

Dicks, J. and Brown, M., Jr., "Intelsat IVA Transmission Systems Design," Comsat Technical Review, Vol. 5, 1, Spring 1975, pp. 73-103.

Details technical features of Intelsat IVA and its improvements and advancements over Intelsat IV.

Heath, G.A., Submarine Cable Systems Technology-Philosophy, paper presented at STC Submarine Cable Systems Symposium, Singapore, February 18-20, 1974.

Ishino, Fumio, Horguchi, Takao, and Hata, Hidetoh , "2700-Channel Submarine Cable System," Japan Telecommunications Review, 14, 2, April 1972, pp. 65-77.

Outlines system design, equipments, and results of commercial test of system for shallow water, put into use between Honsha (Main Island) and Shikoku, in 1972.

Johnsen, Katherine, "Global Satcom System Networks Mature," Aviation Week and Space Technology, 102, March 17, 1975, pp. 61-63.

Provides overview of international and domestic satellite communications system and technologies that are growing, or anticipated within coming year.

"List of Approved National and International Standards, Recommendations, Rules, and Regulations Related to Communications," IEEE Transactions on Communications, October 1974, pp. 1735-1750.

A bibliography listing documents on automatic data and information processing, test instruments and test/measurement procedures, and definitions of communications terms.

Marsten, Richard B., "Launching Communication Satellites," Telecommunications, October 1974, pp. 47-50.

The author, from NASA, elaborates on technical aspects of launching process and its implications for communications satellites.

"Overview of space systems and technology; an historic perspective and the future in space," Electrical Communication 49, 3, 1974, pp. 200-344.

Special issue devoted to communications satellites, includes examination of digital TV transmission for European communication satellites, by W.D. Weston; coverage of ground segment for satcom phase II communications project in NATO, by H. Seither, and more.

Roberts, W. J. M., "Charting a Telephone Cable," Hydrospace, April 1972, pp. 37-40.

Presents problems of a particular marine survey case history, as well as instruments and techniques used to solve it.

Talyzin, N. Y. and C. Y. Kantor, "The Mobile Soviet Earth Station 'Mars': Some Practical results," Telecommunication Journal, Vol, 42, May 1975.

Discusses design features and concepts behind Soviet's newly designed mobile earth station Mars, designed to operate with satellites on both geostationary and elliptical orbits.

CHAPTER FIVE

International Environment and Organization

This is the most general section of the bibliography. It covers almost as many subjects as does the entire document. Its purpose is to provide an overall picture of the legal, regulatory, economic and cooperative schemes between government, industry, and the public in the field of international telecommunications. An overview of subjects indicates the nature and climate of the international telecommunications community.

International Environment and Organization, cont'd.

Abdel-Ghani, A.H., "The Role of the United Nations in the Field of Space Communications," Telecommunication Journal, May 1971, pp. 393-398.

Gives some background information on UN interest in telecommunications, and then concentrates on space communications in the field of education and direct broadcast from satellites.

Aims, Prospects, Organization, and Financing, Eurosat SA, Geneva, Switzerland, 1972, 30 p., (avail. NTIS).

Looks at Eurosat SA. Discusses communication, meteorological and navigation satellites, European space programs, international cooperation.

"The Arab States Broadcasting Union in Brief," European Broadcasting Union Review, Jan. 1972, p. 21.

Gives a brief outline of the ASBU's organizational structure and activities.

Ball, H.K. & Mondre, E., "The Modular Repeater of the European Communication Satellite (ECS) and the Orbital Test Satellite (OTS) - A demonstration of European Collaboration in Space Applications," Journal of the British Interplanetary Society, May 1974, pp. 328-336.

Discusses electronic modules, European space programs, international cooperation, multichannel communication, repeaters, frequency assignments, satellite design and transmission.

International Environment and Organization, cont'd.

Blachier, B.L., "European Participation in the Definition of the next Generation Satellite," Journal of the British Interplanetary Society, May 1974, pp. 337-342.

Discusses European space programs, Intelsat, international cooperation, satellite design, microwave transmission, multichannel communication.

Bolger, P.H., Global Rescue Alarm Network - A Location and Warning System, paper presented at the International Astronautical Federation's 23rd International Astronautical Congress, Vienna, Austria, October 8-15, 1972, 22 p.

Studies satellite relay and omega navigation system for distress signal transmission and reception in global rescue alarm network serving ships, aircraft and spacecraft.

Burckhardt, P.L., Prospectus for a European Company with Regard to the Operation of Regional Application Satellite Systems, paper presented at Eurospace, the 4th W. European Conference, Venice, Italy, Sept. 22-25, 1970, 10 p.

Examines management organization of European operational application satellite systems, concerning interurban telecommunication and air traffic control.

Burckhardt, P.L., Prospectus for a European Company with Regard to the Operation of Regional Application Satellite Systems, paper presented at the 4th Eurospace US-European Conference, Venice, Italy, Sept. 22-25, 1970, 9 p., (avail. NTIS).

Discusses European aerospace and electronic equipment, and industrial cooperation for air traffic control and communication satellites.

Castro, Jose de Almeida, "The Inter-American Association of Broadcasters," European Broadcasting Union Review, Jan. 1972, pp. 22-25.

Briefly describes the membership and activities of the IAAB.

Chakroun, Abdallah, "Maghrebvision," European Broadcasting Union Review, November 1972, pp. 39-42.

Discusses aims and present state of television cooperation between Tunisia, Algeria and Morocco.

Colino, R.R., The Impact of Intelsat on World Telecommunications and Understanding, paper presented at the AIAA 10th Annual Meeting and Technical Display, Washington, D.C., January 28-30, 1974, 10 p.

Deals with Intelsat, international cooperation, satellite networks, system analysis, technology utilization.

Colino, R.R., Proposed Regional Satellite Systems - Will They Be Compatible with Intelsat?, paper presented at Eurospace, the 4th US-European Conference, Venice, Italy, Sept. 22-25, 1970, 13 p.

Studies Intelsat compatibility with independent regional telecommunications satellite systems.

Colpitts, Andre B., and Warren, Colin J., International Patterns of Communications Usage: The Postal, Telegraph and Telephone Industries, Cambridge: MIT Press, 1974.

Interindustry transaction tables compare patterns of telephone, telegraph and mail usage in 13 countries at various stages of economic development. A four-stage pattern at telecommunication development was hypothesized on basis of telephone system statistics.

Corte, Arthur B., International Implications of Low Cost Data Communications, Cambridge: MIT Press, 1974.

Examines existing public international data communication facilities, role of future low cost international communication networks in the flow of information, marketplace for future service, social and cultural implication of network planning, and policy issues involved in setting standards to implement and achieve low cost international data communications.

d'Arcy, Jean, "Challenge to Cooperation," Saturday Review, October 24, 1970, pp. 24+.

Presents the problems of new satellite broadcasting technology to international relations and advocates international cooperation to maximize benefits and minimize conflicts resulting.

Davidson, R.J., "The European Telecommunications Satellite Programme," ESRO/ELDO Bulletin, 1970, pp. 8-15.

Examines European telecommunications satellite project, discussing Intelsat and telephony-telegraphy-telex system.

Dawidziuk, B.M., International Communications Environment and Trends, paper presented at STC Submarine Cable Systems Symposium, Singapore, Feb. 18-20, 1974.

Discusses growth of submarine cable and satellite systems. Traffic growth and diversity are covered and the current construction program reviewed; economic indicators examined.

El Sahhaf, Mohamed Said, "The Significance of the Rome Meeting," European Broadcasting Union Review, Jan. 1972, pp. 18-20.

Briefly describes the membership, recommendations and activities of the Arab States Broadcasting Union.

Fargette, Y., "Intelsat," translated into English from Rev. France des Telecommunications (France), Jan. 1972, pp. 53-56.

Looks at telecommunications by satellite and operation of Intelsat network.

Fawcett, J.E.S., "Outer Space: New Perspectives," International Affairs, July 1973, pp. 358-370.

Discusses European participation activities in satellite launching, cooperation and conflict in the operation of satellites, international regulation and control.

Fernandez-Shaw, Felix, "Television Relations Between Europe & Latin America (I)," European Broadcasting Review, July 1971, pp. 43-45.

Reports on meetings held to include Latin American countries in the EBU news exchange program, which culminated in the establishment of the Ibero-American News Service for this purpose.

Fernandez-Shaw, Felix, "Television Relations Between Europe & Latin America (II)," European Broadcasting Union Review, Sept. 1971, pp. 22-25.

Describes the Organizacion de la Television Iberoamericana (OTI), which is the Latin American organization established for the purpose of providing an organization open to participation by the European broadcasting organizations.

Fraser, D.O., "The Institutional Bottlenecks Affecting Mobile Satellite Communications," in Satellite Systems for Mobile Communications and Surveillance, Proceedings of the International Conference, London, England, March 13-15, 1973, IEEE, pp. 1-8.

Reviews mobile satellite communication systems constraints imposed by international institution disagreements on management, procurement and operation, considering U.S. and European conflicts on Aerosat Project.

Frutkin, Arnold W., International Cooperation in Space, Prentice Hall, Englewood Cliffs, N.J., 1965, 186 p.

Gives a background of international cooperation in space, presents the U.S. program, including cooperation with the U.S.S.R., and examines other mechanisms for cooperation such as European regional organizations, the United Nations, and other agencies.

Frutkin, A.W., "International Cooperation in Space," Science, Vol. 169, 1970, pp. 333-339.

Looks at NASA program for international cooperation in space involving developing and advanced nations, discussing television instruction for India, resource surveys, etc.

The Future of Satellite Communications; Rescurce Management and the Needs of Nations, Twentieth Century Fund Task Force on International Satellite Communications, N.Y., 1970.

Underlines need for informed international planning and coordination to reap benefits of technology and recommends major structural changes in ITU to make it capable of dealing with problems of satellite communications on an international basis.

Galloway, Jonathan F., The Politics and Technology of Satellite Communications, D.C. Heath & Co., Lexington, Mass., 1972, p. 247.

About half of the book is historical in perspective: chapters on "Traditional Communications Policy & the Coming of the Space Age," "Early Developments in Space Communications," "The Passage of the Communications Satellite Act of 1962," "The Interim Arrangements for a Global Commercial Communications Satellite System." The latter half of the book concentrates on subjects with more contemporary applications: "Space Communications and National Security," "INTELSAT & INTERSPUTNIK: American-Soviet Relations Concerning Space Communication," "The Transition Between the Interim and Definitive Arrangements for INTELSAT."

International Environment and Organization, cont'd.

Galloway, Jonathan F., The Transition Between the Interim and Definitive Arrangements for a Global Commercial Communications Satellite System, paper presented at the AIAA 3rd Communications Satellite Systems Conference, Los Angeles, Calif., April 6-8, 1970 7 p.

Examines global commercial communications satellite system arrangements, considering evolutionary political, economic and technological developments within INTELSAT context.

Galloway, Jonathan F., "Worldwide Corporations and International Integration, the case of INTELSAT," International Organization, Summer 1970, pp. 503-519.

Views INTELSAT as an international corporation which has aided world cooperation and international integration. Suggests that the INTELSAT definitive arrangements will give it additional supranational characteristics.

Global Communications in the Space Age; Toward a New ITU, report sponsored by the John and Mary R. Markle Foundation and the Twentieth Century Fund, 1972.

Report of an international conference on the ITU, concerning such subjects as the functions of the ITU, summary of major recommendations, universality of ITU's membership, formulation of general policies, planning and management, resolution of conflicts and disputes, communications research, technical assistance, ITU secretariat.

Gosewinckel, W.G., Long-Range Planning for Telecommunications in a Multinational Environment, paper presented at the American Institute of Aeronautics and Astronautics 5th Communications Satellite Systems Conference, Los Angeles, Calif. April 22-24, 1974, 7 p.

Deals with satellite networks, transmission lines, trans-oceanic systems, cost analysis, Intelsat, international cooperation, project planning, submarine cables.

Gromov, A.N., "Terminology Work Carried Out by Various International Organizations in the Field of Radio," Telecommunication Journal, June 1973, pp. 319-324.

Explores the work of several international organizations in standardization of telecommunications terminology.

Harrington, John V., Notes on Talks Given at MIT Communications Policy Seminar - "Issues and Dilemmas Regarding Satellite Communications," Cambridge: MIT Press, Feb. 1974.

Summary of talks on communications satellites, industry, and policy issues given by COMSAT V.P. of Research and Engineering.

Hartbaum, H.K., "The Applications Satellite Program - A Challenge to th European Communications Industry," Journal of the British Interplanetary Society, March 1974, pp. 178-180.

Discusses Comsat program, European space programs, international cooperation, Fuopean space research organization, policies, regulations, R&D.

Haviland, R.P., "Why Space Broadcasting?," IEEE Spectrum, Vol. 7, 1970, pp. 86-91.

Looks at satellite applications to TV broadcasting for developed and developing areas, considering national and international telecommunications policies.

Henrici, J., Cooperation in the Future US Space Programme - Interest and Cost to Europe, paper presented at the 4th Eurospace US-European Conference, Venice, Italy, September 22-25, 1970, 17 p., (avail. NTIS).

Presents a cost analysis of future European Space Programs with or without NASA cooperation.

Hocker, A. & Howell, T., The Role of Satellites in the Future of Communications; a European View, ESRO, Paris, France, presented at the International Conference of the Accord. Nazl. des Lincei, Rome, 25-56 March 1974, 19 p.

Looks at European space programs, economic factors, ground support equipment, international cooperation, mission planning, wideband communication.

Hughes, C.D., "Trends in Regional Satellite Communications & Broadcasting," in Earth Station Technology, Institution of Electrical Engineers, Conference, London, England, Oct. 14-16, 1970, Proceedings, pp. 37-42.

Discusses satellite regional broadcasting and telephony/data services cost model.

Hult, J.L., Broadcast Opportunities with Satellites and CATV, and Their Control in the Public Interest, Rand. Corp., paper presented at the 7th Space Congress, Technology-Today and Tomorrow, Cocoa Beach, Florida, April 22-24, 1970, 11 p., (avail. NTIS).

Looks at broadcast opportunities with satellite and CATV for an international television system.

Hult, J.L. & Reinhart, E.E., Satellite Spacing and Frequency Sharing for Communication and Broadcast Services, Rand Corporation Paper, P-4508, December 1970.

Gives general approach for efficent use of satellite orbits and radio frequency spectrum. Careful coordination to achieve full potential use of satellite orbits and spectrum can provide enormous capacities far exceeding any current proposals. Propagation factors dictate that lower spectrum should be shared much more intensively before making use of higher frequencies.

Hume, C.R., "Communications Satellites and the International Communications Industry," Journal of the British Interplanetary Society, February 1973, pp. 65-73.

Discusses government/industry relations, aircraft communication, communication cables, international cooperation, submarine cables, transoceanic communication.

"International Communications," Telecommunications International, March 1974, pp. 18-24.

Discussion with members of the International Communications Association regarding their use of international communications; plus comments by representatives of two of the international carriers entitled "The International Telecommunications Explosion" and "The Stimulus for Innovation and Competition in the U.S. International Record Carrier Industry."

"International Conference on Computer Communications," Datamation, November 1974, pp. 93-94.

Reports on the ICCC held in Stockholm on August 12-14, 1974 dealing with the integration of data communications in the international telecommunications network.

International Cooperation in Outer Space: A Symposium, prepared for the Committee on Aeronautical and Space Sciences, U.S. Senate, U.S. Government Printing Office, December 9, 1971.

Includes statements on the Office of Telecommunications Policy, international activities of Comsat, UN Working Group on Direct Broadcast Satellites, ITU, UNESCO's program in space communication, Intelsat, International Institute of Space Law.

International Programs, NASA, Washington, D.C., 1973, 28 p., (avail. NTIS).

Discusses NASA participation in international space programs.

The International Telecommunications Union: Issues and Next Steps, report by the Panel on International Telecommunications Policy of the American Society of International Law, Carnegie Endowment for International Peace, June 1971.

Examines the main issues before the 1971 ITU Space Conference: apportionment of radio frequencies and geostationary "parking slots," direct broadcast satellites, relationship between the ITU and operating systems, and the extent of IFRB powers. Also looks ahead to the 1973 ITU Plenipotentiary Conference and examines the need and possibility of revising the ITU's structure.

Johannessen, G.F., "Signaling Systems...An International Concern," Bell Laboratories Record, January 1970, pp. 13-18.

"To join different national telephone networks into a worldwide network demands careful planning and international cooperation. Standarized signaling systems which bring international direct distance dialing one step closer to reality are examples of those efforts." Describes these efforts to standarized signaling systems and gives operational details of No. 5 bis and No. 6 signaling systems.

Johnsen, Katherine, "Intelsat Reorganization Faces Initial Test," Aviation Week and Space Technology, February 25, 1974, pp. 54-55.

Questions the effective functioning of Intelsat in which the full membership participates on a one-nation-one-vote basis and the U.S. no longer controls the actions of the key 21-member board of governors. Records decisions made at the meeting of February 4-8, 1974.

Johnsen, Katherine, "Soviets Plan Major Earth Station as Link to Intelsat Space System," Aviation Week and Space Technology, April 8, 1974, p. 24.

Mentions use of SPADE terminal equipment by Intelsat members and speaks of USSR's relationship to Intelsat.

Johnson, F.S., ed., International Congress of Space Benefits; Proceedings of the Nineteenth Annual Meeting, Dallas, Texas, June 19-20, 1973, American Astronautical Society, Larzana, Calif., 1974, 514 p.

Contains papers dealing with data management, international cooperation, R&D, satellite television.

Jones, W.T., "The Role of International Standardization in Telecommunication Network Development," Telecommunication Journal, April 1973, pp. 207-210.

Discusses role of regional consultative organizations in effecting world-wide standards for data networks.

Kildow, Judith L., INTELSAT: Policy-Maker's Dilemma, D.C. & Heath Co., Lexington, Mass., 1973, 118 p.

Examines the U.S. communications satellite policies, considering both the background and determinant. Also studies the central issues of INTELSAT, including the operating philosophy-whether commercial or political, and the question a single global system versus separate systems.

Kurakov, P.S. & Petrov, I.Y., "Some Aspects of Development of Space Communications During the Ninth Five-Year Plan," translated into English from Radiotekhov (Moscow), May 1972, pp. 3-8, (avail. NTIS).

Looks at the international space communications organization in socialist countries.

LaVean, Gilbert & Martin, Edward, "Communication Satellites: The Second Decade," Astronautics and Aeronautics, April 1974, pp. 54-60.

Discusses latest trends in space telecommunications: ITU projects; Intelsat system; Canadian Telsat system; U.S. domestic systems; projects by Comsat/AT&T, Western Union, American Satellite Corp., General Telephone & Electronics, RCA Globcom, and CML; military systems; Russian Molniya system; mobile systems, technology trends.

Lay, S. Houston & Laubenfeld, Howard J., The Law Relating to Activities of Man in Space, University of Chicago Press, Chicago, 1970, 333 p.

Analyzes relevant laws of nations as they presently exist and indicates areas in which consensus and rule-making are now or soon will be essential. Appendices cover: US military programs; US jurisdiction over "crimes and certain other acts in outer space;" international organizations and outer space activities; treaties, statutes and other legal documents.

Leive, David M., The Future of the International Telecommunication Union: A Report for the 1973 Plenipotentiary Conference, American Society of International Law, November 1972.

Evaluates effectiveness of ITU and presents recommendations for consideration by 1973 Plenipotentiary Conference to improve its structure and operations such as reorganization of ITU's legislative bodies, regulatory organs, governing council and various secretariats.

Lennertz, D., "The Aerosat Programme," Industries Atomiques et Spatiales, November-December 1972, pp. 60-67.

Studies management and cost of European-U.S. Aerosat program based on geostationary satellites for air/ground voice and data messages relay and aircraft position determination.

Lutz, S.G., Orbit Utilization-From Both Sides, paper presented at the AIAA 3rd Communications Satellite Systems Conference, Los Angeles, Calif., April 6-8, 1970, 7 p.

Looks at orbit-utilization, discussing sharing of satellite communication frequency bands and use of multiple earthward antenna beams.

Maddox, B., "A Brazilian Satellite - For What --- Educational Television Service," New Scientist, April 25, 1974, pp. 178-179.

Discusses ATS, satellite television, international cooperation, educational television.

Maddox, B., "Mendonia's Dream of Brazil in Space --- Space Program Implementation," New Scientist, April 18, 1974, pp. 114-115.

Deals with communication satellites, remote sensors, international cooperation, research projects, satellite networks.

Maeda, Yoshinari, "The Asian Broadcasting Union and What It Stands For," European Broadcasting Union Review, January 1972, pp. 14-17.

Briefly describes the membership and activities of the ABU.

Management of the Space Segment of Application Satellite Systems, Eurosat S.A., Geneva, Switzerland, 1973, 32 p., (avail. NTIS).

Discusses European space programs, management methods, mission planning, project management, financial management, international cooperation.

Moesl, G., "The Symphonic Project Organization --- For Franco-German Communication Satellite" in Technology Today and Tomorrow; Proceedings of the Tenth Space Congress, Cocoa Beach, Florida, April 11-13, 1973, Cape Canaveral Council of Technical Societies, Cape Canaveral, Florida, 1973, pp. 3-7 to 3-16.

Discusses European space programs, international cooperation, Symphonic satellites, financial management, space craft launching.

Moylan, James J., "The Role of the International Telecommunications Union for the Promotion of Peace Through Communication Satellites," Case Western Reserve Journal of International Law, Winter 1971.

Discusses the problems of the ITU - greater demands for the limited natural resource - the radio frequency spectrum, and the organizational stagnation in the modern era of satellite communications.

Murthy, H.G.S., Role of the United Nations in Space Applications, paper presented at the International Astronautical Federations 24th International Astronautical Congress, Baker, USSR, October 7-13, 1973, 6 p.

Deals with cost effectiveness, international cooperation, technology utilization, UN.

Myers, S.M., "Frequency Allocations," in EASCON '71; Electronics and Aerospace Systems Convention, Washington, D.C., October 6-8, 1971, Record, N.Y., Institute of Electrical and Electronics Engineers, Inc., 1971, pp. 121-127.

Reports on international frequency allocation table revision by World Administrative Radio Conference for space telecommunications.

National Science Foundation, Papers and Proceedings of a Colloquium on the Effects of International Technology Transfers on U.S. Economy, Washington, D.C., 1973, 109 pp.

Assesses relationships between U.S. technological innovations and U.S. foreign investments, licensing, trade; between investment, licensing and transfer of U.S. technology abroad; between that transfer and change in U.S. exchange earning and economic welfare. Research and policy options available are considered. Bibliography included.

Pelton, Joseph N., Global Communications Satellite Policy: INTELSAT, Politics & Functionalism, Lamond Systems, Inc., Mt. Airy, Md., 1975.

Discusses the establishment and operation of INTELSAT, examines the likelihood of INTELSAT serving as a model of international scientific cooperation and investigates the relationship of INTELSAT to growing multinational enterprises.

Pfeifer, E.R.K. and Viellard, P., The Franco-German Telecommunication Satellite Symphonic, paper presented at the AIAA Third Communications Satellite Systems Conference, Los Angeles, Calif., April 6-8, 1970, 8 p.

Looks at Franco-German telecommunication satellite Symphonic mission objectives and system design.

"The Piero Fanti Space Communications Station," Italy, Documents and Notes, Vol. 21, July-August 1972, pp. 313-320.

Discusses Italian participation in international satellite communications activity.

Polishuk, Paul and Wilk, Charles K., "Computer Telecommunications: The International Revolution," Telecommunications, September 1975, pp. 85-92.

Recognizes wide range of potential services at lower costs to public through growth of computers and telecommunication technology. Explores expanding social and economic opportunities for developed and developing nations, role of information transfer, and notes computer applications, growth projection, and national policy implications.

Pritchard, Wilbur L., "Satellite Communications," Telecommunications, April 1974, pp. 19-20.

Historical present and future overview of international satellite communications, first in a series organized by author.

Proceedings of the 13th Colloquim on the Law of Outer Space, Konstanz, West Germany, October 4-10, 1970, Fred B. Rothman & Co., South Hackensack, New Jersey, 1971.

Includes such articles as: "The Use of Space Communication for Information, Education and Cultural Exchange"; "Direct Proadcasting by Satellite" by P. Magno; "The United Nations, Its Specialized Agencies and Communications Satellites" by R.R. Colino; "Special Report on United Nations Institutions Concerned with Space Activities" by A.H. Abdel-Ghani; "United Nations and Space Law" by G.P. Zhukov.

Rambaud, Pierre, "International Symposium on Educational Satellites," European Broadcasting Union Review, July 1971, pp. 33-36.

Reports on the symposium held May 3-7, 1971 on educational satellites. Includes description of studies and projects (Indian, Andes and "Socrate") and constraints (of a pedagogical, cultural and sociological nature).

Rettig, Richard A., "Science, Technology and Public Policy," World Politics, Vol. XIII, 2, Jan. 1971, pp. 273-293.

This article is very broad. It presents a general overview - historical, contemporary and future of variables that should be considered and have been considered in the making of policies regarding science and technology.

The Second Fifteen Years in Space, Proceedings of the Eleventh Goddard Memorial Symposium, Washington, D.C., March 8-9, 1973, American Astronautical Society, Tarzanna, Calif., 1973.

Includes such papers as: "An International Outlook of the Second Fifteen Years in Space" by A.H. Abdel-Ghani (pp. 185-193) and "Review of European Space Projects after 1980" by M. Levy (pp. 177-184).

Smythe, Dallas, W., "The 'Orbital Parking Slot' Syndrome and Radio-Frequency Management," Quarterly Review of Economics and Pusiness, Summer 1972, pp. 7-17.

Gives a politico-economic analysis of the "orbital slot" program for communications satellites and suggests that full prior consultation with nations on a hemispheric basis is necessary to avoid wasteful and inequitable use of "orbital slots" for such satellites in the interest of both more and less developed nations.

Snow, Marcellus, International Commercial Satellite Communications: Cost Structure & Charging Policy, Praeger Special Studies, scheduled for Dec., 1975 publication.

"Utilizing financial data from INTELSAT, this study examines economic issues relating to the commercial use of satellite communications. A series of political, commercial and economic criteria are identified for judging INTELSAT's performance from a welfare standpoint."

Sommerlad, E. Lloyd, "Broadcasting from Space-Cooperation or Chaos?," Telecommunication Journal, May 1971, pp. 399-401.

Examines roles of UNESCO and professional organizations, social role of the media, regional cooperation to aid developing countries and mentions the desirability of a more active role for the UN.

Space Activities and Resources; A Review of the Activities and Resources of the United Nations, of Its Specialized Agencies and of Other Competent International Bodies Relating to the Peaceful Uses of Outer Space, U.N., N.Y., 1972.

Lists and describes all U.N. agencies (eg., ITU), other intergovernmental organizations (eg., INTELSAT, INTERSPUTNIK) and non-governmental organizations (eg., International Astronautical Federation) as well as reproducing the texts of pertinent resolutions adopted by the general assembly, and a list of U.N. documents on outer space.

Space Communications: Increasing U.N. Responsiveness to the Problems of Mankind, report of a National Policy Panel established by the United Nations Association of the USA, May 1971.

Considers the use of space communications to aid the U.N. in its efforts: Peacekeeping stands, development assistance program, educational television for development, and disaster warning and relief.

Storbom, N-B., "Nordvision," European Broadcasting Review, Sept. 1971, pp. 26-30.

Reports on Nordvision - "An organization for the mutual exchange of programmes and other forms of internal cooperation between television programme units in the broadcasting organizations of the five Scandinavian countries..." Discusses background basic principles, program exchanges, co-productions.

Sueur, R., The Symphonic Project and Its Application, paper presented at the 4th Eurospace U.S. European Conference, Venice, Italy, September 22-25, 1970, 15 p., (avail. NTIS).

Reviews program on Symphonic French-German Communication Synchronous Satellite.

Telecommunication & the Peaceful Use of Outer Space, ITU, Geneva, Switzerland, 1973, 134 p., (avail. NTIS).

Records the proceedings of international telecommunication organization on peaceful uses of outer space with emphasis on frequency assignments for space communication.

Thompson, Geoffrey, "International Communications 'Management' is 'Coordination'," Communications News, November 1975.

Examines international telecommunications management, coordinating function of ITU and its structure and regulatory structure within international telecommunication industry.

Tilton, John E., International Diffusion of Technology: The Case of Semiconductors, Brookings Institution, Washington, D.C., 1971, 176 p.

A study in economic regulation, the book looks at development of new technology, its high concentration in certain geographic areas, and other factors with impact on economic growth, per capita income, comparative advantage, and corporate subsidiaries abroad. Provides insight into the diffusion process by examining the dissemination of semiconductor technology in U.S., Great Britain, France, Germany and Japan.

Towards Improving U.S. - Latin American Telecommunications Relations, Teleconsult, Inc., Washington, D.C., NTIS No. PB-214 619/9, October 1972.

Reviews present relationships between U.S. and Latin American telecommunications policy-level institutions, and recommends appropriate initiatives for establishing substantive and continuing relations with institutions and individuals responsible for policies, regulations and ITU relationships.

Turner, C.K., "The Use of Satellites to Meet Future Press Requirements, Industries Atomiques et Spatiales, May-June 1972, pp. 98-107.

Deals with international cooperation, satellite transmission, data transmission, economic factors, European space programs, satellite networks, signal to voice ratios.

Urgent Decisions Regarding the Future of European Communication Satellite Programmes, Eurospace, Paris, France, 1970, 9 p.

Examines European space and communication satellite programs priority considerations, noting operational hardware.

"The Use of Computers and Telecommunications; Towards an International Policy," OECD Observer, February 1973, pp. 17-28.

Highlights of 3 OECD reports are summarized: "Computers and Telecommunications: Economic, Technical and Organizational Issues," "Automated Information Management in Public Administration: Present Developments and Impact" and "Toward Central Government Computer Policies: Data Base Development and International Dimensions."

Wallenstein, Gerd, D., "The Internationalization of Telecommunications Systems Development," Telecommunication Journal, January 1974, pp. 33-38.

Explores different types of compatibility in telecommunication services, search for single, world-wide compatibility standards, and impact of those developments on national telecommunications industries.

Wallenstein, Gerd, D., The ITU in Action, Institute for Public Policy Analysis, Stanford University, 1972, 54 p.

Presents an historical view of the ITU approach to space telecommunications and examines the World Administrative Conference - Space Telecommunication 1971.

Washburn, Abbott, "The International Telecommunications Satellite Organization," Public Utilities Fortnightly, Oct. 28, 1971, pp. 27-33.

Discusses the regulatory mechanism of Intelsat, as well as its present and future structure. Also discusses the US role via Comsat, of technical and operating manager of Intelsat.

Washington University Program on Application of Satellite Communication to Educational Development Progress Report, Washington University, St. Louis, Missouri, 1970, 150 p.

Discusses economics, educational television, spacecraft communication, international cooperation, microwave equipment.

Whitman, J.G. & Davison, W.W., "The New Hotline-Via Satellite Direct Communications Link," Signal, March 1974, pp. 52-55.

Discusses ground stations, Intelsat, international cooperation, point-to-point communications, data transmission, satellite tracking, systems engineering, USSR & U.S.

CHAPTER SIX

International Trade

U.S. trade in telecommunications is documented, as is worldwide trade independent of the U.S. Trade records, statistics, worldwide market environment, and other articles with policy and economic emphasis relevant to trade are included. The reader should also see section (2) U.S. Telecommunications Industry, where articles related to trade issues in the U.S. were previously listed.

International Trade, cont'd.

Bazzy, William, "International Telecommunications," Telecommunications International, February 1973, p. 18.

Discusses problem of U.S. balance of payments deficit in telecommunications industry.

Bazzy, William, "Telecommunications - A Responsibility for World Trade," Telecommunications International, April 1973, pp. 21-22.

Discusses balances of trade and payments, and the opportunities for the rapidly expanding telecommunications industry through the 1980's.

Bazzy, William, "Telecommunications Trade and the ITU," Telecommunication, Vol. 9, Nos. 4 & 5, April & May 1975.

A two-part editorial outlined obstacles to development of international trade and offered possible solutions to the dilemma. Author is president of ITU.

Bignami, E.N., ed., "Market Opportunities in the '70's," Telecommunications, March 1972, p. 10.

Takes a brief look at electronics markets in Japan, Europe and the U.S. for the 1970's.

"The Common Market Rewires Its Phones," Business Week, April 13, 1974, pp. 42-44.

Reports on the expanding European market for communications equipment, especially for the technologically more advanced equipment of U.S. manufacturers.

"Communication Equipment Sales in Far East: Prospects for Long Term Substantial," Commerce Today, March 4, 1974, pp. 15-16.

Reports on a U.S. telecommunications trade mission to Singapore, Philippines and Taiwan, where there is a potentially strong market for telecommunications equipment.

Consolidated Tabulation: U.S. International Trade of Communication and Selected Electronic Products for Calendar Years 1967-72, Bureau of Competitive Assessment and Business Policy, Washington, D.C., April 1973, NTIS no. COM-73-50576.

Contains complete record of previous releases on U.S. international trade in communications and electronic products for 1967-71 (revised) and summary of recent product, country and trading partners, trends and summary tables.

"Foreign Suppliers to Continue Trend Assembling PABXs in the U.S.," Telephone Engineer and Management, January 15, 1974, pp. 108+.

Interview of Thomas Corless, Bureau of Competitive Assessment and Business Policy of the Department of Commerce. Answers questions dealing with projected international telephone and telegraph revenues, new facilities, programs and technology, developments in the balance of trade.

Galloway, Jonathan F., "Worldwide Corporations and International Integration, The Case of Intelsat," International Organization, Summer 1970, pp. 503-519.

Views Intelsat as an international corporation which has aided world cooperation and international integration. Suggests that the Intelsat definitive arrangements will give it additional supranational characteristics.

Gosewinckel, W.G., Long-Range Planning for Telecommunications in a Multinational Environment, paper presented at the American Institute of Aeronautics & Astronautics 5th Communications Satellite Systems Conference, Los Angeles, Calif., April 22-24, 1974, 7 p.

Deals with satellite networks, transmission lines, transoceanic systems, cost analysis, Intelsat, international cooperation, project planning, submarine cables.

Kimbel, Dieter, Computers and Telecommunications: Economic, Technical and Organizational Issues, OECD, 1973, 222 p.

Studies the interaction of computers and telecommunications in such areas as technological development, macroeconomies considerations, market entry issues, economic planning and policy considerations, and international cooperation.

"More Sales of Communications Equipment in Mid-East Foreseen," Commerce Today, August 5, 1974, pp. 21-22.

Report by U.S. communications equipment and services trade mission on market prospects in the Middle East for U.S. communications equipment suppliers.

"Telecommunication Firms Get Soviet, Polish Leads," Commerce Today, October 30, 1972, pp. 40-41.

Short report on first commerce-organized trade mission to the USSR and Poland specializing in electronic communications equipment. Points out that U.S. export control regulations remain a factor that must be considered in evaluating sales prospects in communist countries.

Telecommunications, National Export Expansion Council, Bureau of International Commerce, U.S. Department of Commerce, December 1973, 173p.

Identifies the major problems that threaten expansion of U.S. telecommunications exports and recommends concerted government/industry action needed to strengthen the U.S. position in world markets.

"The World's Telephones - 1974," Electrical Communications, Vol. 50, No. 1, 1975, pp. 77-79.

Statistical survey of number of telephones in the world in 1974, listed by country; includes increase over 10 years, number of telephone conversations, and telephones by continental area.

"The Top 300 in World Banking: Annual Review," Banker, June 1973, pp. 611-691.

Mentions data transmission systems and Society for Worldwide Interbank Financial Telecommunications.

CHAPTER SEVEN

International Financial and Technical Cooperation

Section (7) highlights several international communications projects financed or developed and implemented by developed and developing countries together, and programs between countries with complex communications systems and developing communications systems. Resulting social and economic issues associated with developing telecommunications and developing countries are included, although these issues are touched upon in other chapters.

The Application of Space Technology to Development, U.N., Department of Economic and Social Affairs, N.Y., 1973.

Contains a section (pp. 14-25) on satellite communications and its applications. Discusses earth stations, direct television broadcast, satellite communications for education, culture and information, UNDP assistance for satellite communications, legal problems, allocation of frequency band for direct broadcast satellites, considerations of technical feasibility of direct broadcast satellites, COMSAT, INTELSAT, and INTERSPUTNIK.

Chaman Lal, V., "A Review of Krishi Darshan; an Indian Experiment in Rural Instructional Television," Telecommunication Journal, August 1974, pp. 501-505; and September 1974, pp. 550-557.

Reviews Indian television project for importing instructions in improved agricultural technology to farmers in 80 villages. Indicates required improvements in management, technical maintenance, program presentation and overall coordination.

Chitnis, P.V., Karnik, K.S., and Rao, B.S., "Satellite Television - A Formidable Tool for National Development," in Space and Communication - Acquisition and Transmission of Data in Space Applications Systems, Union des Associations Techniques Internationales & Societe Francaise des Electroniciens et des Radioelectriciens, International Conference, Paris, France, March 29 - April 2, 1971, Communications, Vol. 1, pp. 39-56.

Describes joint India-US satellite instructional television experiment for national development using ATS-F spacecraft.

Control of the Direct Broadcast Satellite: Values in Conflict, Aspen Institute on Communications and Society, in Assocation with the Office of External Research, US Department of State, Palo Alto, Calif., 1974, 156 p.

Eleven essays discuss social implications of direct broadcast satellites, ATS programs, impact on cultures and cultural protectionism, national sovreignty, and legal aspects of satellites. Includes bibliography.

Feldman, N.E., The Communication Satellite--A Perspective for the 1970's, Rand Corporation Paper, P-4658, September 1971.

Examines the necessary arrangements to develop new applications with large growth potential for both populated and underdeveloped regions.

Frutkin, A.W., "International Cooperation in Space," Science, Vol. 169, 1970, 333-339.

Looks at NASA program for international cooperation in space involving developing and advanced nations, discussing television instruction for India, resource surveys, etc.

Gimpelson, Lester A., "Communications Planning for Developing Countries," Electricial Communication, Vol. 48, No. 4, 1973, pp. 359-364.

Examines five aspects of planning which are particularly important for a high growth area: forecasting, service concept, planning technology, appropriate communications equipment, and technological flexibility.

Hawkins, Howard R., "International Satellite Communications for The People's Republic of China," Signal, June 1973, pp. 57-61.

Written by Howard Hawkins, Chairman of RCA Globcom, detailing RCA Globcom's role in providing the People's Republic of China with global satellite communications.

Manufacture of Telecommunications Equipment and Low-Cost Receivers, U.N. Industrial Development Organization, N.Y., 1972.

Reports on the development meeting on the manufacture of telecommunications equipment, including low-cost receivers for sound broadcasting and television. Meeting was held 13-24 October, 1969, to discuss the advisability of developing countries manufacturing telecommunications equipment.

Ploman, Edward; Pierce, William & Lorfs, Jaques, South America, Prepatory Study of the Use of Satellite Communication for Education and National Development, UNESCO, Paris, May 1970.

Examines the social and educational status and related problems of Argentina, Uruguay, Chile, Peru, Ecuador, Colombia and Venezuela. These findings are then considered in light of the broadcast and telecommunication developments within these countries to date, to determine the feasibility of adopting individual satellite systems to meet the social and educational needs of each country.

Telecommunication; Sector Working Paper, World Bank, November 1971.

Describes the economic, financial and institutional characteristics of telecommunications, the role it plays in the general process of economic development, and reviews scale and approach of World Bank operations in telecommunications.

CHAPTER EIGHT

International Telecommunications Law

This section includes articles on the international legal framework as it affects telecommunications.

(a) "International Law Applied to Telecommunications" cites articles on international law relevant to telecommunications, and international legal technical societies that provide a legal background for the international telecommunications community (pp. 8.2-8.3).

(b) "Law of Space" references legal philosophies that influence space law (pp. 8.4-8.5).

(c) "Space Telecommunications" is more specific and includes detailed laws and legal procedures that must be resolved when defining an acceptable international legal framework for telecommunications and space (pp. 8.6-8.22).

(d) "Law and Military Uses of Outer Space" refers to U.S. defense communications, and worldwide utilization of space for military purposes as they relate to the current and pending international legal framework of space law (pp. 8.23-8.25).

International Telecommunications Law, cont'd.

a) International Law Applied to Telecommunications

Alexandrowicz, Charles Henry, The Law of Global Communications, Columbia University Press, N.Y., 1971.

Contents include: 1) legal status of the operational communication space and its impact on organization of global services, 2) technical law and law-making processes, 3) technical organs and export diplomacy, 4) mixed public and private agencies in the field of global communication, 5) legal factors supporting globality of agencies of international communication.

Digest of International Law, Vol. 9, Department of State, U.S. Government Printing Office, December 1968, pp. 690-1037.

Entire section on telecommunications covering legal framework, telegraph, telephone, radio cables and other physical connections, and space communications. Presents the international legal framework governing all aspects of international telecommunications.

Fernandez-Shaw, Felix, "The New International Telecommunication Convention (ITC) of Malaga-Torremolinos (1973)," European Broadcasting Union Review, March 1974, pp. 21-26.

Describes the new ITC which was adopted by the ITU Plenipotentiary Conference at Malaga-Torremolinos, which met September 14 - October 25, 1973.

Kolosov, Y.M., Interrelation Between Rules and Principles of International Outer Space Law and General Rules and Principles of International Law, paper presented at the International Astronautical Federations 24th International Astronautical Congress, Baker, USSR, October 7-13, 1973, 7 p.

Discusses satellite television, information dissemination, international cooperation, politics, sovereignty, UN.

McWhinney, Edward, ed., The International Law of Communications, Oceana Publications Inc., Dobbs Ferry, N.Y., 1971.

Collection of essays on such subjects as development of international law of communications, the technological environment for international communications, unilateralism in U.S. satellite communications policy, international institutions for telecommunications - the ITU's role, East-West cooperation in space telecommunications, and others.

Pepin, Eugene, "General Legal Problems in Space Telecommunications," Telecommunication Journal, May 1971, pp. 386-388.

Reports on such legal factors as allocation, assignment and registration of frequencies; protection against harmful interference, geostationary satellites, "pirate" space stations; spacecraft and space vehicles in distress or emergency.

International Telecommunications Law , cont'd.

b) Law of Space

American Society of International Law, Paper(s) on the seminar on direct satellite broadcasting held in Bellagio, Italy, will be published around Summer 1975.

Csabafi, I.A., The Concept of State Jurisdiction in International Space Law; A Study in the Progressive Development of Space Law in the United Nations, Martimas Nijhoff, The Hague, Netherlands, 1971, 219 p.

Looks at UN international space law development, discussing concepts of state jurisdiction, territorial sovereignty, damage liability, etc.

Diederiks - Verschoor, I.H.P., The Impact of Space Law on General International Law, paper presented at the International Astronautical Federation's 24th International Astronautical Congress, Baku, USSR, October 7-13, 1973, 6 p.

Deals with international and space law, sovereignty, legal liability, UN.

Jones, Erin Bain, Earth Satellite Telecommunications Systems and International Law, University of Texas at Austin, 1970, 167 p.

Presents an historical legal survey on the question of jurisdiction from aerospace to outer space and reviews activities in the UN which have helped create a codified law for space.

Magno, P. & Verdacchi, C., Air and Space Hi-Jacking --- Criminal Aspects, paper presented at the International Astronautical Congress, Baku, USSR, October 7-13, 1973, 44 p.

Includes information on communication satellites, international cooperation, space law, legal liability.

Prevost, Jeffrey, "Law of Outer Space-Summarized," Cleveland State Law Review, September 1970, pp. 595-611.

Deals with definition of outer space and examines in depth the Outer Space Treaty.

Vosburgh, John A., White, Irvin L., & Wilson, Clifton E., Law and Politics in Outer Space; A Bibliography, University of Arizona Press, Tucson, Arizona, 1972.

This is a collection of articles, UN materials and U.S. government documents, most written in the 1960's on space law and politics. It also gives a list of associations and institutes, theses, bibliographies, reports, conferences and yearbooks dealing with law and politics in outer space.

International Telecommunications Law , cont'd.

c) Space Telecommunications

Broadcasting from Space, proceedings of the UNESCO meeting on international arrangements in space communication, Paris, December 2-9, 1969, published 1971, 65 p.

Includes reports on free-flow-of-information, unauthorized use of programs transmitted by satellite, frequency assignment problems, the UN and space communications, the ITU.

Brown, Elton R., "Direct Broadcast Satellites & Freedom of Speech," California Western International Law Journal, Spring 1974, pp. 374-393.

Examines the direct broadcast satellite as it relates to the UN treaty on outer space and the US Constitution. Gives a constitutional and international analysis of the Canada-Sweden and USSR proposals for direct broadcast satellites, and examines the two major problems-freedom of information and propaganda.

Busak, Jan, "The Need for an International Agreement on Direct Broadcasting by Satellites," Journal of Space Law, Fall 1973, pp. 139-154.

Deals with agreements and decisions adopted in the sphere of the ITU and questions to be settled in the near future at UN level concerning direct satellite broadcasting.

Colino, Richard R., "Intelsat: A Comparison of the Interim and Definitive Arrangements," European Broadcasting Union Review, September 1971, pp. 49-56.

Compares the Intelsat interim and definitive agreements in such areas as the juridical status of the organization, the organizational structure, the Intelsat governing body, management arrangements, assembly of parties, meeting of signatories, financial provisions, etc.

Colino, Richard R., The Intelsat Definitive Arrangements: Ushering in a New Era in Satellite Telecommunications, European Broadcasting Union, Geneva, Switzerland, 1973.

Presents chapters dealing with "Background to the negotiation of definitive arrangements," "Negotiation of the definitive arrangements," "Analysis of key features of definitive arrangements," and "Commentary on two significant controversies" (the controversy over specialized services, and the rights and obligations of Intelsat members). Also includes copy of the "Agreement relating to the International Telecommunications Satellite Organization 'Intelsat'," its annexes, and the "Operating Agreement relating to the International Telecommunications Satellite Organization 'Intelsat'."

Columbia Journal of Transnational Law, Vol. 13, 1974, 186 p.

This entire issue deals with "The Control of Program Content in International Telecommunications," Subjects include: "The Antinomy of Policy and Function in the Law of International Telecommunications," "The Control of Program Content in International Telecommunications," "Direct Satellite Broadcasting and the Third World." "The Role of the ITU in Harmful Interference Disputes," and "Utilization of the Geostationary Orbit - A Need for Orbital Allocation?"

Conference on International Telecommunications by Satellite, Stanford University School of Law, 1970.

This is a two volume collection of papers presented at the conference on April 2 & 3, 1970. Titles of papers include: policy problems in direct broadcasting from satellites; communications satellites: domestic regulation and international cooperation; regulating use of the radio spectrum; the Soviet Union and international telecommunications; organizational implications of the "parking slot" problem for regional communications satellite systems; perspectives in the emerging law of satellite communications and others (see also the June 1970 issue of the Stanford Journal of International Studies).

"Deadlock Blocks Satellite TV Policy," Aviation Week and Space Technology, April 15, 1974, p. 39.

Short report on deadlock between U.S. and USSR over political and legal status of direct satellite television. Deals with the question of broadcast "spillover" into neighboring countries.

Dersi, G., Outer Space - T.V. Law as Jus Speciale; Some Remarks to the Legal Aspects of Direct Television Broadcasting from Outer Space, paper presented at the International Astronautical Federation's 24th International Astronautical Congress, Baku, USSR, October 7-13, 1973, 6 p.

Discusses international law, satellite television, space law, economic factors, satellite networks, social factors, system effectiveness.

"Direct Satellite Broadcasting and the First Amendment," Harvard International Law Journal, Summer 1974, pp. 514-527.

Analyzes "the extent to which the free speech provision of the First Amendment to the Constitution may inhibit the United States from participating in an international agreement to regulate the content of direct satellite broadcasting."

Dittrich, Robert, "Transmission Via Space Satellites," European Broadcasting Union Review, January 1972, pp. 52-58.

Reports on the UNESCO and WIPO (World Intellectual Property Organization) - sponsored meeting of governmental experts convened in Lausanne, Switzerland from April 21-30, 1971. The meeting was held to discuss the problems of the protection of producers of phonograms, performers and broadcasting organizations, and the field of copyright questions raised by transmission via satellite. Includes an article-by-article explanation of the "Draft Convention to Prohibit the Unauthorized Distribution of Program-Carrying Signals Communicated by Satellites."

Doyle, Stephen E., "Permanent Arrangements for the Global Commercial Communication Satellite System of Intelsat," The International Lawyer, April 1972, pp. 258-291.

Provides a summary of the principle aspects of the 1964 agreement on interim arrangements for Intelsat, as well as a summary of the history and organization of the Plenipotentiary Conference on Definitive Arrangements for Intelsat, and highlights of the definitive arrangements.

Doyle, Stephen E., "Permanent Charter for Intelsat," Department of State Bulletin, October 18, 1971, pp. 415-418.

Summarizes major provisions of definitive agreements signed August 20, 1971, by the U.S. and 53 other members of Intelsat.

Dudakov, B.G., Legal Aspects of Direct Television Broadcasting, paper presented at the International Astronautical Federation's 24th International Astronautical Congress, Baku, USSR, October 7-13, 1973, 13 p.

Discusses information flow, international law, satellite television, sovereignty, television transmission, international cooperation, satellite orbits, synchronous satellites.

Dugmore, Kent C., "The Newest Frontier in Communications: The Direct Broadcast Satellite," The United States Air Force JAG Law Review, Fall 1971, pp. 259-269.

Discusses some basic technological aspects of direct broadcasting, the international political implications and problems, the U.S. attitude, and the question of regulation of direct broadcast satellites.

Fawcett, J.E.S., "Satellite Broadcasting," The World Today, February 1971, pp. 76-82.

Discusses the problems associated with direct satellite broadcasting and also suggests some possible administrative reforms for Intelsat.

Geston, Mark S., "Direct Broadcasting from Satellite, The Case for Regulation," New York University Journal of International Law and Politics, Spring 1970, pp. 72-93.

Discusses the need for regulation because frequencies are scarce, space slots are limited, duplicate systems would be wasteful, and the jamming of direct broadcasts to one state without affecting transmissions to other states is extremely difficult.

Gottlieb, Allan, Dalfen, Charles, & Katz, Kenneth, "The Transborder Transfer of Information by Communications and Computer Systems: Issues and Approaches to Guiding Principles," American Journal of International Law, Vol. 68, 1974, pp. 227-257.

Examines the question of national sovereignty as it pertains to direct broadcast satellites, remote sensing of the earth, and transborder computer data storage.

Henry, Nancy L., "The Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite: A Potshot at Poaching," New York University Journal of International Law & Politics, Winter 1974, pp. 575-596.

Reviews the "Convention Relating to the Distribution of Programme-Carrying Signals Transmitted by Satellite" adopted on May 21, 1974 in Brussels. Examines the treaty in the light of satellite "poaching," alternatives to the treaty, conflicts of interest, the Brussels Convention where it was adopted, and the drafting process.

Hult, J., Satellite Spacing and Frequency Sharing for Communication and Broadcast Services, Rand Corp. Paper, Santa Monica, Calif., 1970, 38 p.

Gives a general approach for the efficient use of satellite orbits and the radio frequency spectrum. The protection of received signals, equipment capabilities, and pertinent systems considerations are reviewed before systematically examining the principle direct and scatter modes of interference.

"The Intelsat Conference: A Resume," The Journal of International Law and Economics, January 1972.

Briefly reviews the Plenipotentiary Conference on Definitive Arrangements for Intelsat, conducted between February 24, 1969 and May 21, 1971.

International Telecommunication Union, Tenth Report by the International Telecommunication Union on Telecommunication and the Peaceful Uses of Outer Space, Geneva, 1971.

Reports on the activities of the General Secretariat of the ITU, of the International Frequency Registration Board, the International Radio Consultative Committee, and the International Telegraph and Telephone Consultative Committee. Also contains reports on progress made in the development of space communications by 39 countries, and pertinent UN resolution.

International Telecommunication Union, Eleventh Report by the International Telecommunication Union on Telecommunication and the Peaceful Uses of Outer Space, Geneva, 1972.

Reports on decisions of World Administrative Radio Conference for Space Telecommunications, application of international regulations concerning international registration of frequency assignments to space telecommunications, telecommunications studies and standardization, planning of international telecommunications network, technical cooperation activities, cooperation with other international organizations concerned with space, and information and documentation activities. Also contains reports on progress made in development of space communications by 40 countries and pertinent UN resolutions.

International Telecommunication Union, Twelfth Report by the International Telecommunication Union on Telecommunication and the Peaceful Uses of Outer Space, Geneva, 1973.

Reports on application of international regulations concerning international registration of frequency assignments to space telecommunications, telecommunications studies and standardization, planning of the international telecommunication network, technical cooperation activities, cooperation of other international organizations concerned with space, and information and documentation activities. Also contains reports on progress made in development of space communications by 44 countries and pertinent UN resolutions.

Jones, E.B., Earth Satellite Telecommunications Systems and International Law, University of Texas, Austin, 1970, 173 p.

Reviews earth satellite telecommunications systems and international law covering historical scientific, economic, legal and political background.

Kolosov, Y., "The Mass Media and International Law," International Affairs (Moscow), July 1973, pp. 53-58.

Discusses international propaganda, freedom of information, international law.

Kolosov, Yuri, "TV and International Law," New Times, April 1974, no. 15.

Reports on the seminar on direct satellite broadcasting sponsored by the International Broadcast Institute and the American Society of International Law in Bellagio, Italy. Presents USSR's argument against unrestricted direct satellite broadcasting.

Lay, S. Houston & Lauberfeld, Howard J., The Law Relating to Activities of Man in Space, University of Chicago Press, Chicago, 1970, 333 p.

Analyzes relevant laws of nations as they presently exist and indicates areas in which consensus and rule-making are now or soon will be essential. Appendices cover: U.S. military programs; U.S. jurisdiction over "crimes and certain other acts in outer space"; international organizations and outer space activities; treaties, statutes and other legal documents.

Leive, David M., International Telecommunications and International Law: The Regulation of the Radio Spectrum, Oceana Publications Inc., Dobbs Ferry, N.Y., 1970.

Analyzes the means by which a natural resource available to all nations - the radio spectrum - is apportioned among and used by these nations. Examines in detail the institution primarily responsible for regulating use of the spectrum (ITU) and the international law establishing rules of conduct that govern such use. Includes bibliography.

Magno, P., The Direct Broadcasting by Satellite, paper presented at the International Astronautical Federation's 21st International Astronautical Congress, Konstanz, West Germany, October 4-10, 1970, 73 p.

Examines juridical problems in satellite direct TV broadcasting, discussing regulation proposals submitted to UN and educational applications.

Masouye, Claude, "The Distribution of Signals Transmitted by Satellite (or the 'Nairobi Turning-Point')," European Broadcasting Union Review, September 1973, pp. 40-51.

Reports on the UNESCO and WIPO-sponsored meeting held in Nairobi July 2-11, 1973 to discuss the establishment of international regulations preventing any reception that has not been expressly authorized. Includes an article-by-article explanation of the Convention drafted at the Nairobi meeting, as well as a copy of the Convention itself.

Masouye, Claude, "The Gestation of a New International Convention Regarding Space Satellites," European Broadcasting Union Review, September 1972, pp. 51-62.

Reports on the "Draft Convention against the Unauthorized Distribution of Programme-Carrying Signals Transmitted by Satellites" adopted at the UNESCO and WIPO-sponsored meeting in Paris, held May 9-17, 1972. Includes an article-by-article explanation of the convention, as well as a copy of the Convention itself.

Masouye, Claude, "The New Luxembourg Copyright Legislation; A Commentary," European Broadcasting Union Review, May 1972, pp. 40-49.

Gives an article-by-article explanation of the Luxembourg Copyright Act of March 1, 1972, and provides a copy of the act.

Masouye, Claude, "The Protection of Signals Carrying Radio and Television Programmes Transmitted by Communication Satellites," Telecommunication Journal, May 1971, 389-392.

Studies the problems involved with unauthorized "poaching" of satellite-transmitted radio and television programs.

Masouye, Claude, "Towards a System of International Protection of Programme-Carrying Signals Transmitted Via Satellite?," European Broadcasting Union Review, July 1971, pp. 61-67.

Reports on the "Draft Convention to Prohibit the Unauthorized Distribution of Programme-Carrying Signals Communicated by Satellites" adopted as the UNESCO and WIPO-sponsored meeting in Lausanne, Switzerland, held April 21-30, 1971. Includes a copy of the Draft Convention.

McIntyre, Stuart H., "U.S. Cautions Against Premature International Regulation of Developing Direct Broadcast Satellite Technology," U.S. Department of State Bulletin, July 30, 1973, pp. 197-200.

This is excerpted from a statement made in the Working Group on Direct Broadcast Satellites (UN Committee on the Peaceful Uses of Outer Space) by U.S. Representative McIntyre, Deputy Director for Oceano, Outer Space, and Disarmament of the Department's Office of United Nations Political Affairs. Gives U.S. position on international regulation of direct satellite broadcasting.

Mizrack, Richard, "The Intelsat Definitive Arrangements," Journal of Space Law, Fall 1973, pp. 129-138.

Describes the new Intelsat organization, particularly the structural and financial aspects, in order to convey some understanding of how it will work in the future.

Namurois, Albert, "Memorandum on Direct Television Broadcasting by Satellite and the Legal Norms for Its Use," European Broadcasting Union Review, January 1975, pp. 58-74.

Gives a review of direct television broadcasting as it relates to international law, especially in connection with the U.N. Subjects covered include an historical review, applicable law, rights of states, international cooperation, state responsibility, consent and participation, spill-over, program content, consultation between states, and intellectual rights.

Nichols, Josef C., "Some Aspects of Direct Satellite Broadcasting," European Broadcasting Union Review, pp. 10-19.

Outlines the potential benefits, legal aspects, and technical developments of direct satellite broadcasting, and contains three annexes: definitions established by the ITU regarding direct satellite broadcasting, allocation of frequencies for direct satellite broadcasting, and list of international instruments submitted to the Working Group on Direct Broadcast Satellites, March 1974.

Patermann, C., The Question of the Law Applicable in Cases of Damage Caused by Direct Satellite Broadcasts (Facts by TV Broadcasting), paper presented at the International Astronautical Federation's 24th International Astronautical Congress, Baku, USSR, October 7-13, 1973, 14 p.

Deals with legal liability, sovereignty, space law, satellite television, international cooperation, international law.

Plenipotentiary Conference on Definitive Arrangements for the International Telecommunications Satellite Consortium, report of the Interim Communications Satellite Committee, February-March 1969, June-July 1969, January 1970.

This is the basic document concerning Intelsat, and is necessary as background information on the organization and operation of Intelsat.

Ploman, Edward W., "UN Working Group on Direct-Broadcast Satellites," International Broadcast Institute Newsletter, Fall 1970, pp. 4-6.

Reviews activities of the UN Working Group on Direct Broadcast Satellites created to study "the technical feasibility of communication by direct broadcasts from satellites...as well as the implications of such developments in the social, cultural, legal, and other areas."

Poulantzas, Nicholas M., "Direct Satellite Telecommunications: State Sovereignty v. Freedom of Information," Netherlands International Law Review, no. 2, 1973.

Reports on the UNESCO "Draft Declaration of Guiding Principles on the Use of Satellite Broadcasting for the Free Flow of Information, the Spread of Education and Greater Cultural Exchange" which was finally formulated and recommended to the Director-General of UNESCO following the meeting of May 23-26, 1972. Annexed to the article is the "Draft Convention on Principles Governing the Use by States of Artificial Earth Satellites for Direct Television Broadcasting."

Proceedings of the 13th, 14th, 15th, and 16th Colloquiums on the Law of Outer Space, Fred B. Rothman and Co., South Hackensack, New Jersey, 1971, 1972, 1973, 1974.

These records of the annual proceedings include such articles as "The Use of Space Communication for Information, Education and Cultural Exchange"; "Direct Broadcasting by Satellite"; "The United Nations, Its Specialized Agencies and Communications Satellites"; "Special Report on United Nations and Space Law"; "Some International Legal Issues on the Direct Television Broadcast Satellites"; "Space Law and International Action"; "Direct Satellite Telecommunications - Recent Legal Developments"; "Aribtration Provisions Governing International Commercial Communications Satellites"; "Prospects of Direct Television and Radio Broadcasting by Satellite --- In Framework of Space Law."

Pustisek, Inko, "Overcoming Barriers to International Broadcasting," European Broadcasting Union Review, July 1971, pp. 10-16.

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Rybakov, Yu. M., "Problems of Space Law, TV, Research," Current Digest of the Soviet Press, April 28, 1970, pp. 6-7.

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Sdougos, Z.N., "Potential Response of Maritime Services to Craft and Persons in Distress at Sea," in International Space Rescue Symposium, 4th, Brussels, Belgium, September 21, 1971, Proceedings, International Academy of Astronautics, Paris, 1973, pp. 149-166.

Discusses international cooperation, navigation satellites, radio equipment.

Siebert, Fred S., "Property Rights in Materials Transmitted by Satellites," Journalism Quarterly, Spring 1971, pp. 17-25.

Studies the problem of establishing international order to protect and facilitate the use of intellectual materials for satellite transmission and broadcasting - what program materials can be used on a world-wide basis, how are the proprietors of those program materials to be protected in their ownership, and how are they to be compensated for such world-wide use.

Steup, Elisabeth, "The Protection of Authors in the Case of Satellite Transmissions", European Broadcasting Union Review, November 1973, pp. 73-79.

Discusses the legal questions involved in authors' broadcasting rights via satellites. Makes legal distinctions between direct broadcast, point-to-point, distribution, and storage satellites.

Thorne, F. & Clarke, F. J., "World Administrative Radio Conference for Maritime Mobile Telecommunications (Geneva, 1974)," Telecommunication Journal, December 1974, pp. 733-740.

Reports on the results on the April/May 1974 meeting of the World Administrative Radio Conference.

"United States Proposes Voluntary Principles on Direct Broadcasting by Satellite," The Department of State Bulletin, April 22, 1974, pp. 445-451.

Contains the statement by U.S. Representative Lee Stull, Director of the State Department's Office of U.N. Political Affairs given to the U.N. Outer Space Committee's Working Group on Direct Broadcasting Satellites. Also contains the text of the U.S. working paper submitted to the Working Group.

University of Toronto Law Journal, vol. 20, no. 3, 1970.

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Zhukov, G.P., Vasilevshaya, E.G., and Lukin, P.I., "Legal Aspects of the Utilization of Artificial Satellites for Meteorological and Radio Communication Purposes", translated into English from the book Pravovyye Aspekty Ispolzovaniya Iskusstvennykh Sputnikov Dlya Tseley Meteorologii I Radiosvyazi, Moscow, Nauka Press, 1970, 156 p. (avail. NTIS).

Looks at international cooperation, space law, radio relay systems, UN, world data centers.

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Dehart, W.D., EMC Analysis of Communication Satellite Systems --- For Defense Satellite Communication System and NATO Satellite Communication System, paper presented at the AIAA 5th Communications Satellite Systems Conference, Los Angeles, Calif., April 22-24, 1974, 6 p.

Discusses defense communications satellite system, international cooperation, satellite networks, NATO, electromagnetic compatibility, regulations.

Dwyre, D.G., The IDCSP/A Satellite - Concept and Performance, paper presented at the AIAA 3rd Communications Satellite Systems Conference, Los Angeles, Calif., April 6-8, 1970, 9 p.

Studies initial defense communication satellite program/ augmentation satellite design and mission, onboard communications equipment, control subsystems, American-British cooperation, etc.

Galloway, Jonathan F., The Politics and Technology of Satellite Communications, D.C. Heath & Co., Lexington, Mass., 1972, 247 p.

About half of the book is historical in perspective; chapters on: "Traditional Communications Policy and the Coming of the Space Age"; "Early Developments in Space Communications"; "The Interim Arrangements for a Global Commercial Communications Satellite System". The latter half of the book concentrates on subjects with more contemporary applications: "Space Communications and National Security"; "INTELSAT and INTERSPUTNIK: American-Soviet Relations concerning Space Communication"; "The Transition Between the Interim and Definitive Arrangements for INTELSAT".

Lay, S. Houston & Lauberfeld, Howard J., The Law Relating to Activities of Man in Space, University of Chicago Press, Chicago, 1970, 333 p.

Analyzes relevant laws of nations as they presently exist and indicates areas in which consensus and rule-making are now or soon will be essential. Appendices cover: U.S. military programs; U.S. jurisdiction over "crimes and certain other acts in outer space"; international organizations and outer space activities; treaties, statutes and other legal documents.

Pool, I. De Sola, Research Program on Problems of International Communication and Security, Final Report, MIT, Cambridge, Mass., 140 p., (avail. NTIS).

Reports on international communications between the Soviet Union and China during a crisis.

Ulsamer, Edgar, "AWACS, USAF's Most Successful Development Program", Air Force, July 1974, pp. 69-76.

Deals with the AWACS (Airborne Warning and Control System), which can detect, track and manage large numbers of aircraft, and can contribute to the command and control of land and sea forces.

Wall, V.W., "Military Communication Satellites --- Defense Satellite Communications System", in International Telemetering Conference, Washington, D.C., October 9-11, 1973, Proceedings, pp. 233-240.

Discusses military spacecraft, skynet satellites, international cooperation, NATO, satellite design.

Wall, V.W., Satellites for Military Communications --- Worldwide Command and Control Systems, paper presented at the AIAA 10th Annual Meeting and Technical Display, Washington, D.C., January 28-30, 1974, 8 p.

Discusses military spacecraft, skynet satellites, technology assessment, ground stations, international cooperation, satellite design and networks, systems engineering.

9. GLOSSARY

AIAA	- American Institute of Aeronautics & Astronautics
ATS	- Applications Technology Satellite
avail. NTIS	- available from the National Technical Information Service, U.S. Department of Commerce
CATV	- Cable television
CCITT	- Consultative Committee on International Telephone & Telegraph
CEPT	- Conference for European Posts & Telegraph
COMSAT	- Communications Satellite Corporation
COSPAR	- Committee for Space Research
DBS	- Direct Broadcast Satellite
ECS	- European Communication Satellite
ESRO	- European Space Research Organization
ESS	- Electronic Switching System
FCC	- Federal Communications Commission
GHz	- Gigahertz
IDCSP/A	- Initial Defense Communication Satellite Program/Augmentation
IDDD	- International Direct Distance Dialing
IEEE	- Institute of Electrical & Electronics Engineers
INCOSPAR	- Indian National Committee for Space Research
INTELSAT	- International Telecommunication Satellite Organization
ITC	- International Telecommunication Convention
ITU	- International Telecommunication Union
MHz	- Megahertz
NASA	- National Aeronautics & Space Administration
NATO	- North Atlantic Treaty Organization
NTIS	- National Technical Information Service, U.S. Department of Commerce
OECD	- Organization for Economic Cooperation & Development
PBX	- Private Automatic Branch Exchange
SHF	- Super-High Frequency

Glossary, cont'd.

SPADE	- Single-channel-per-carrier PCM multiple-access demand-assignment equipment
STC	- Standard Telephone and Cable
TASI	- Time Assignment Speech Interpolation
T/C	- Telecommunication
TDMA	- Time-Division Multiple Access
UNESCO	- United Nations Educational, Scientific, Cultural Organization
WIPO	- World Intellectual Property Organization

10. PERIODICALS, INDEXES AND RESEARCH FACILITIES

Periodicals to be checked on a regular basis:

Electrical Communication
European Broadcasting Union Review
Journal of Space Law
Point-to-Point Communications
Telecommunication Journal
Telecommunications

Periodicals to be checked on a semi-regular basis:

Aviation Week and Space Technology
Bell Laboratories Record
COMSAT Technical Review
RCA Engineer

Useful Indexes:

Applied Science and Technology Index
Business Periodicals Index
Electronics and Communication Abstracts
Index to Legal Periodicals
International Aerospace Abstracts
National Technical Information Service
Public Affairs Information Service
Selected Rand Abstracts

Useful Research Facilities:

American Society of International Law, Library
Federal Communications Commission, Library
NASA Scientific and Technical Information Facility
United Nations Information Center

11. AUTHOR INDEX

Page numbers refer to the location of the author's last name, usually in the lefthand margin of the page. However, the name may be listed as second or third author of an article and should not be overlooked. Occasionally an author is mentioned (in the case of an anthology or contract report) within the annotation only.

Author Index, cont'd.

Name	Page
Abdel-Ghani, A.H.	5.2
Adams, L.H.	2.37
Adelaar, H.H.	4.2
Alexandrowicz, C.H.	8.2
Allaway, H.G.	4.2
Anderson, C.	4.30
Arnaud, G.W.	2.37
Arnold, R.	4.2
Arora, O.R.	4.24
Astholz, P.L.	4.2
Averch, H.	2.2
Baczko, H.	2.21
Badalov, A.L.	4.3
Baker, J.P.	4.3
Ball, H.K.	4.3,5.2
Ball, J.E.D.	2.12,4.14
Barodich, S.V.	4.3
Bargelline, P.L.	4.4,4.5,4.23
Barstow, J.M.	4.5
Bassett, D.A.	4.22
Baumol, W.J.	2.21
Bayless, J.W.	4.5
Bazzy, W.	2.21,6.2
Bedrosian, E.	4.5
Belotserkovskiy, O.M.	2.12
Bens, A.R.	4.22
Berger, A.F.	4.26
Berman, G.	2.12
Bernard, J.J.	4.6
Bignami, E.N.	6.2
Blachier, B.L.	4.6,4.7,5.3
Blake, G.A.	2.12
Bobroff, S.	2.9
Bolger, P.H.	4.7,5.3
Borchardt, K.	2.2,2.33
Briskman, R.	4.7
Brod, E.	2.22
Brown, A.	4.8
Brown, E.R.	8.6
Brown, J.V.	4.15
Brown, M., Jr.	4.30
Brun, G.	4.21
Burckhardt, P.L.	3.2,5.3
Busak, J.	8.6
Busignies, H.	4.8

11. Author Index, cont'd.

Name	Page
Cacciami, E.R.	4.8
Campanella, S.J.	4.5,4.8,4.9
Capron, W.M.	2.2
Carassa, F.	4.9
Castro, J.A.	5.4
Chakroun, A.	5.4
Chaman Lal, V.	7.2
Chapman, J.H.	3.2
Charyk, J.V.	2.12
Chitnis, E.V.	7.2
Chitre, N.K.M.	4.14
Clarke, F.J.	8.21
Coburn, A.R.	2.22,4.9
Colby, D.B.	2.2
Cole, J.E.	2.9,2.22, 2.37
Colino, R.R.	5.4,8.6,8.7
Collins, A.A.	2.22,4.9
Colpitts,A.B.	5.4
Connolly, R.	2.3
Contzen, J.P.	3.2
Cook, J.S.	4.10
Corte, A.B.	5.5
Covault, C.	4.10
Crew, G.L.	4.11
Csabafi, I.A.	8.4
Dalfen, C.	8.11
d'Arcy, J.	5.5
Davidson, R.J.	5.5
Davison, E.H.	4.14
Davison, W.W.	2.19, 5.27
Dawidzuik, B.M.	2.23,3.2,5.5
Dehart, W.D.	8.23
Demaree, A.L.	2.33
Dersi, G.	8.8
Deschuytere, L.C.	4.11
Dicks, J.	4.30
Diedericks-Verschoor,I.H.P.	8.4
Dill, G.D.	2.23
Dinkespiler, J.A.	4.11
Dittrich, R.	8.9
Doret, P.	2.32
Doyle, S.E.	8.9
Drufuca, G.	4.9
Dudakov, B.G.	8.10
Dugmore, K.C.	8.10
Durany, F.	4.24
Durrani, S.H.	2.24
Dwyre, D.G.	4.12,8.23

11. Author Index, cont'd.

Name	Page
Edelson, B.	4.12
Egbe, E.	3.3
El Shahaf, M.S.	5.6
Emerine, R.J.	2.3,2.33
Ende, A.H.	2.4
Engel, G.R.	2.25
Evans, B.G.	2.13,2.25
Fackelman, M.P.	2.37
Falk, H.	4.13
Farell, E.	2.13,2.25
Fargette, Y.	5.6
Farrar, J.R.	2.13
Fawcett, J.E.S.	5.6,8.10
Feldman, N.E.	2.13,2.25,4.13,7.3
Fennessey, E.	4.13
Fere, P.	4.7
Fernandez-Shaw, F.	5.6,5.7,8.2
Franklin, C.A.	4.14
Fraser, D.O.	5.7
Frutkin, A.W.	5.7,7.3
Fuenzalida, J.C.	4.14
Galloway, J.F.	5.8,5.9,6.3,8.23
Garner, W.B.	2.26
Gaston, R.L.	4.30
Geller, H.	2.4
Geston, M.S.	8.10
Gies, T.G.	2.7
Gimpelson, L.A.	2.26,7.3
Girinsky, A.	4.27
Goldberg, A.J.	4.5
Goldhammer, H.	2.10
Golding, L.S.	4.14
Goode, G.E.	2.13
Gordon, L.	3.3
Gosewinckel, W.G.	5.9,6.4
Gottlieb, A.	8.11
Griffiths, E.	3.3
Grisdale, G.L.	4.14
Gromov, A.N.	5.10
Hansen, G.	3.3
Hanson, C.W.	4.15
Harrington, J.V.	5.10
Hart, J.L.	4.15
Hartbaum, H.K.	3.3,5.10
Hata, Hidetoh	4.30
Haviland, R.P.	2.14,5.10
Hawkins, H.R.	7.4
Heath, G.A.	4.30
Henrici, J.	5.11
Henry, N.L.	8.11
Herter, E.	4.15
Hines, S.	2.4

11. Author Index , cont'd.

Name	Page
Hobbs, M.	3.4
Hocker, A.	5.11
Horguchi, Takae	4.30
Hornish, W.M.	2.14
Howell, T.	5.11
Hughes, C.D.	4.15,5.11
Hult, J.L.	4.16,5.11,5.12,8.11
Hume, C.R.	2.4,3.4,5.12
Hupe, H.H.	2.26
Intartaglia, D.A.	2.14
Ishino, Fumio	4.30
Israel, D.R.	2.15,2.16
Jamison, M.	3.5
Jankovich, J.L.	3.5
Jaynes, D.	4.16
Jeruchim, M.C.	4.18
Johannessen, C.H.	4.16,5.13
Johnsen, K.	4.31,5.14
Johnson, E.W.	4.15
Johnson, F.S.	4.17,5.14
Johnson, G.D.	4.17
Johnson, L.	2.2
Johnston, F.J.H.	2.5,2.27
Jones, E.B.	8.4,8.13
Jones, W.T.	5.15
Jowett, J.K.S.	4.17
Kahan, A.E.	2.5
Kaiser, J.	4.18
Kane, D.A.	4.18
Kantor, C.Y.	3.10,4.32
Karnick, K.S.	7.2
Katz, K.	8.11
Kelly, C.M.	2.13,4.13
Kildow, J.L.	5.15
Klass, P.J.	4.18,4.19
Kimbel, D.	2.28,6.4
Kirchof, W.	4.18
Klacksiem, J.P.	4.19
Klevorick, A.K.	2.21
Knopow, J.J.	4.19
Koenig, W.A.	4.7
Kolosov, Y.M.	8.2,8.14
Kotsolios, N.	2.16
Kupp, H.	4.15
Kurakov, P.S.	5.15
Kurakawa, J.	3.5
Lago, A.	2.10,2.28
Larsson, L.	2.16
Lasher, S.	2.11
Lauberfeld, H.J.	5.16,8.14,8.24
LaVean, G.	2.16,3.6,5.15
Lay, S.H.	5.16,8.14,8.24
Leive, O.M.	5.16,8.14
Leland, H.	2.28
Leme, M.J.	3.5
Lennertz, D.	5.16
Lerner, E.M.	2.28
Lerner, N.C.	2.29

11. Author Index , cont'd.

Name	Page
Levitt, H.	4.19
Lipinski, A.J.	2.29
Logiadis, M.E.	4.20
Loomis, H.	2.17
Lorfs, J.	3.8,7.4
Lowell, R.R.	4.22
Lukin, P.I.	8.22
Lutz, S.G.	4.20,5.16
Lynch, J.	4.2
MacNaughton, J.D.	3.6
Maddox, B.	3.6,5.17
Madqwick, R.	3.7
Madigan, H.	2.29
Maeda, Y.	5.17
Magno, P.	8.5,8.15
Marsten, R.B.	4.31
Martin, E.	2.16,3.6,5.15
Martin, N.A.	2.35
Masouye, C.	8.15,8.16
McCormack, J.	2.35
McIntyre, S.H.	2.10,8.16
McKenzie, A.A.	4.20
McWhinney, E.	8.3
Mertens, H.	4.21
Mizrack, R.	8.17
Moesl, G.	5.18
Mondre, E.	4.3,5.2
Moylan, J.J.	5.18
Murthy, H.G.S.	5.18
Myers, S.M.	5.18
Naleszkiewicz, W.	2.5,2.29
Namurois, A.	8.17
Neill, D.V.	4.21
Nichols, J.C.	8.17
Nichols, R.T.	2.35
Onufry, M.	4.9
Oslund, J.	2.11
Ostergren, C.N.	2.30
Owen,B.M.	2.5.,2.11
Pappas, D.G.	4.15
Paraboni, A.	4.9
Patermann, C.	8.17
Payne, W.F.	4.22
Peck, M.J.	2.6
Pederson, R.D.	2.22,4.9
Pelton, J.N.	5.19
Pepin, E.	8.3
Petrov, I.Y.	5.15
Pfeifer, B.R.K.	5.19
Pierce, W.	3.8,7.4

11. Author Index , cont'd.

Name	Page
Pipe, R.	2.17,3.8
Ploman, E.W.	3.8,4.22,7.4,8.18
Polishuk, P.	5.20
Pool, I.D.S.	8.24
Popot, M.	4.22
Poulantzas, N.M.	8.18
Preston, H.	2.23
Prevost, J.	8.5
Pritchard, W.L.	2.17,4.23,5.20
Puente, J.G.	2.17,4.23,4.29
Pustisek, I.	8.19
Raag, H.	4.23
Rambaud, P.	5.21
Rao, B.S.	4.24,7.2
Rauschenbach, G.J.	4.24
Raynor, R.A.	2.6
Reid, A.L.	2.30
Reinhart, E.E.	5.12
Rettig, R.A.	5.21
Roberts, W.J.M.	4.32
Robins, W.P.	3.9
Rogers, J.C.	2.17
Rosenbrock, K.H.	4.24
Rugo, J.J.	4.24
Rybakov, Y.M.	8.19
Sarkar, S.K.	2.18
Schadoff, S.	4.26
Schaible, G.J.	4.24
Schenck, H.H.	4.25
Sciulli, J.A.	4.8
Schmidt, W.G.	4.25
Schwartz, M.D.	8.19
Scott, L.J.	4.25
Scrupski, S.E.	2.3
Sdougas, Z.N.	2.18,8.20
Segrue, D.F.	4.25
Seither, H.	4.31
Shepherd, W.G.	2.7
Siebert, F.S.	8.20
Silverman, P.B.	2.36,4.26
Simmons, N.	3.9
Smith, G.A.	4.26
Smythe, D.W.	5.21
Snow, M.	5.22
Sommerlad, E.L.	5.22
Spann, R.M.	2.30
Sperry, R.	2.7
Spintig, J.	3.10
Stamminger, R.	2.26
Stanley, K.B.	2.7,2.36
Steup, E.	8.20

11. Author Index, cont'd.

Name	Page
Storbam, N.B.	5.23
Sueur, R.	5.23
Suppes, P.	3.5
Suyderhoud, H.G.	4.9
Szarvas, G.G.	4.26
Talyzin, N.W.	3.10,4.32
Tant, M.J.	4.27
Tat, T.N.	4.27
Teacher, C.F.	4.19
Terzani, C.	4.28
Thompson, G.	5.24
Thorne, F.	8.21
Tilton, J.E.	5.24
Trebing, H.M.	2.7,2.8
Trisko, G.	2.24
Trushel, R.C.	4.26
Turner, C.K.	2.19,5.25
Uhl, E.G.	2.37
Ulsamer, E.	8.24
Vasilevshaya, E.G.	8.22
Verdacchi, C.	8.5
Verguese, D.	2.32
Viellard, P.	5.19
Vosburgh, J.A.	8.5
Wachs, M.	4.29
Wall, V.W.	8.24,8.25
Wallenstein, G.	5.26,8.21
Wangermee, R.	3.10
Warren, C.J.	5.4
Washburn, A.	5.26
Werth, A.M.	4.12,4.23
weston, J.D.	4.31
Westrum, R.	2.10
Wheatley, N.	2.32
White, G.	3.11
White, I.L.	8.5
Whitman, J.G.	2.19,5.27
Wilk, C.K.	5.20
Wilcox, C.	2.8
Williamson, E.	2.16
Wilson, C.E.	8.5
Winston, D.C.	2.32
Wood, H.W	4.29
Wright, L.M.B.	2.19
Wu, W.W.	4.29
Yatrakis, P.G.	2.32
Zeidler, G.	2.19,2.20
Zhukov, G.P.	8.22

12. SUBJECT INDEX

Numbers in the index refer to the page numbers of the specific citation only; annotations with subect descriptions often follow on the top of the next page. It is to the reader's advantage to scan thoroughly the page referred to, for more than one article on the page listed may apply to the subject description. Other articles on the page may be of peripheral interest.

12. Subject Index, cont'd.

A

AIAA	4.4,4.7,4.9,4.13,4.14,4.15
A-J effect	2.2,2.7,2.21,2.30
AT&T	
corporate structure	2.30,2.33,2.34
interview with J. deButts	2.34
investment policy	2.7,2.36
research and development	3.6
ATS program	4.3,4.10,4.20,5.17,7.3
Aerosat program	2.15,2.16,5.7,5.16
Agricultural technology	7.2
Air traffic control systems	4.11,4.17,5.13
Algeria	5.4
American Satellite Corporation	3.6
Analog Systems	4.16
Arab States Broadcasting Union	5.2,5.6
Asian Broadcasting Union	5.17
Australia	3.4,3.7,3.11

B

Banking	2.18,6.5
Bibliographies	4.31,8.5,8.14
Brazil	3.5,3.6,5.17
Broadcasting, international	8.19
Direct broadcast satellites, see	
Inter-American Association of Broadcasters	5.4
management trends	3.10
technology	5.5,5.10,5.11,5.12,5.22

C

CATV	2.13,2.31,3.5,5.12
CCITT No. 6 common channel signaling	4.6,4.11,4.20,4.23
CEPT	2.30
Cable, submarine telephone, see	
Submarine telephone cable	
Cameroon	3.3
Canadian space programs	2.13,3.2,3.5-3.7,4.10,4.14
Channel capacity	4.22
Channel interference	4.29
China, People's Republic of	3.2,7.4,8.24
Coding, digital	4.5
Communications Satellite Act, 1962	5.8
Computers	2.24,2.25,2.28,6.4
international conference	5.12
legal issues	4.7,5.11
policy	2.17,5.9,5.20,5.25
speech proceeding activities	4.18,4.19
store and forward techniques	4.3,4.27
Comsat	2.35,4.12,5.26,7.2
Communications Satellite Act, 1962	5.8
digital TV system	4.19
Intelsat manager (U.S.)	5.26
investment policy	2.36
research and development	3.6,4.18
speech predictive encoding	4.19
structure	2.35
Congressional research, recommendations	2.6,2.10,2.11,2.36

12. Subject Index, cont'd.

D

Data Communications	2.13,2.14,2.16,2.18,2.24, 2.27,4.8,5.4,5.12,5.25, 5.27
datel	2.13
management systems	2.14,5.14
policy issues	3.8,5.4
security	2.13
SPADE system	4.8,4.12,4.23
transmission by sensor field	4.5
worldwide system and standards	5.15,5.26,8.22
Defense communications	4.12, 4.15, 8.23-8.27
Delta 29 launch vehicle	4.2
Demand assignment	2.17,2.23,4.23
Demand forecasting	2.10,2.13,2.21,2.22,2.24-2.26,2.28,2.32,4.28
Developing countries(also see individual countries)	7.2,7.3,7.5
Diagnostic systems	4.25
Digital systems	4.5,4.11,4.19
Direct broadcast satellites (DBS), general	2.10,2.18,3.2,3.5,4.8,5.20, 7.2, 7.3
earth stations (also see Earth stations)	2.18,7.2
economics	2.26
frequency issues	4.20,4.28,5.21,7.2
legal issues	7.2,8.6-8.8,8.10,8.11,8.14-8.16, 8.18-8.21
regulation, control	2.10, 7.3
Third World	8.7
UN working groups	2.10,8.16,8.18,8.21

E

Earth station technology	2.22,2.24,2.29,2.32,4.7,4.9, 4.18,5.27,8.25
mobile station 'Mars'	4.32
monitoring interruptions	4.26
off-shore services	4.17
SITE project	4.24
Soviet technology	4.32,5.14
SPADE system	4.8,5.14
EBU	3.10,5.6
Echo cancelling devices	4.9,4.10,4.24
Economic cooperation, international	7.1-7.5
Economics of communications, general	2.34
A-J effect	2.2,2.7,2.21,2.30
computers	2.24,2.25,2.28
cost analyses	2.13,2.26,2.29
econometric models	2.24,2.29
financial, institutional characteristics	2.4,2.5,2.15,7.5
regulation	2.2-2.8,2.10,2.21,2.28,2.30 2.34,2.36,5.24
revenues	2.22,2.24,2.31
satellite/cable trade-offs	2.3,2.6,2.22,2.29
theories	2.2,2.3,2.5,2.8,2.21,2.30,2.34
U.S. industry (also see U.S. telecommunication industry)	2.2,2.5-2.7,2.27,2.33

12. Subject Index, cont'd.

Education	
ATS programs	4.3,4.10,4.20,5.17,7.3
cultural exchange	2.12,5.20,8.18,8.19
Europe (Western)	3.5,4.22
mass media	3.5
satellite applications	4.22,5.17,5.21,5.26,8.18
South America	3.5,3.6,3.9,7.4
technology	3.5
UNESCO	5.22
Equipment, telecommunications	
aerospace and electronic	3.24,4.3,5.3,6.5,6.21
European market	6.2
manufacturing	7.4
microwave	5.26
Mideast sales	6.4
multiplex, international	4.11
PABX	6.3
receivers, low cost	7.4
sales in Europe, ITT	2.36
trade	6.1-6.5
Error coding	4.29
Europe (also see individual countries)	
Aerosat	2.15,2.16,5.7,5.16
aerospace and electronic equipment	3.2,4.3,5.3,6.5,6.21
Ariane launcher	3.10
EBU	3.10,5.6
education	3.5,4.22
Eurosat SA	5.2
Eurovision	4.21
Ibero-American news service	5.6,5.7
IDDD	3.4
management organization	5.3
research and development	3.4,4.21,5.10
satellites	3.2,3.3,3.7,5.6
space programs	2.15,3.6,3.10,4.6,5.2,5.10, 5.11,5.17,5.18,5.21,5.25
space systems	4.16
F	
Facsimile services	2.27,4.20
Federal Communications Commission, U.S.	2.3,2.4,2.7,8.4
Fiber optics	4.8,4.10
Financial assistance and cooperation, international	7.1-7.5
Forecasting	2.10,2.13,2.21,2.22,2.24-2.26, 2.28, 2.29,2.32,4.28
French-German satellite program	5.18,5.19,5.23
Frequency spectrum	2.2,4.16,4.20,4.28,5.12,5.21, 8.14,8.22
frequency assignment	4.3,4.18,5.18,5.24
frequency management	2.2
frequency sharing	4.14,4.18,5.12
G	
General Telephone and Electronics(GT&E)	3.6
Geostationary satellites	4.17
Germany	3.4,4.15,5.19,5.23

12. Subject Index, cont'd.

H

Historical perspectives 4.3,5.8,5.21
Hotline 2.19
Hydrostatic test chamber 4.26

I

ITT
- CCITT 6, common channel signaling 4.6,4.11,4.20,4.23
- corporate structure 2.34,3.6
- equipment sales 2.34,2.36
- investment policy 2.7
- NT 2000 telephone 2.19,2.20,4.2
- quality control system 2.16

India 3.4,3.8
- ATS program 5.7,7.2,7.3
- INCOSPAR 3.4
- Krishi Darshan 7.2
- rural instructional TV 7.2,7.3

Indonesia 3.7
Industry structure (also see U.S. industry) 2.2-2.4,2.6,2.9,2.11,2.33-2.37
INTELSAT, general 2.16,2.25,2.27,2.33,2.35,3.6 4.12,4.22,4.29,5.4,5.6,5.8 5.9,5.15,5.26-5.27,6.4,7.2
- Comsat role 5.26
- economics 5.22
- Intelsat IV 2.9,2.27,4.4,4.10
- Intelsat IVA 2.29,4.30
- Intelsat V 2.25,4.30
- law 8.9,8.12,8.17-8.19,8.21
- reorganization 5.14
- U.S.S.R, and 5.14,8.23

Inter-American Association of Broadcasters 5.4
International Communications Association 5.2
International direct distance dialing (IDDD) 2.19,2.20,3.4,4.17,4.25
International record carriers (also see individual carriers) 2.3,2.5,2.14,2.36,3.6,5.12
International Telecommunication Union (ITU) 5.15,5.26,8.21
- conference issues 5.13
- functions 5.9
- future 5.16
- history 5.26
- promoting peace 5.18,5.24,8.12,8.13,8.21
- reorganization 5.8,5.9,5.14,5.16

INTERSPUTNIK 5.8,7.2
Israel 3.4
Italy 3.4,3.8,3.9,5.20

J

Jamaica 3.3
Japan 3.4,3.5,4.30,6.2

K

12. Subject Index, cont'd.

L

Latin America 5.6,5.7,5.24
Law, international telecommunications 2.9,5.16,8.1-8.25
bibliographies 8.5,8.14
broadcasting 8.19
computers 8.11
concepts, international 8.4
cooperational, international legal 8.3,8.13,8.18,8.19,8.22
criminal aspects 8.5,8.14
direct broadcast satellites 7.2,8.6,8.7,8.8,8.10,8.11, 8.14-8.16,8.18-8.21
First Amendment 8.8
free-flow-of-information 8.6,8.11,8.14,8.18
frequency issues 8.3,8.6,8.11-8.14,8.22
history 8.4,8.23
INTELSAT 8.6,8.7,8.9,8.12,8.17-8.19, 8.21
International Convention, 1973 8.2
ITU 8.3,8.6,8.7,8.12-8.14
Law of Outer-space Colloquiums 8.19
laws, existing international 8.14
Luxembourg Copyright Act 8.15
maritime issues 8.20
mass media 8.14
military 8.14,8.23,8.27
NATO 8.23,8.24
orbit use 8.7,8.10
Outer Space Treaty, 1967 8.5,8.19
"pirate" space stations 8.3
program content 8.7,8.17
propaganda 8.6,8.14
property rights 8.20
protection of authors 8.20
radio spectrum (also see Frequency issues) 8.14
regulation 8.8,8.14,8.16,8.22,8.23
satellite 'poaching' 8.11,8.16
sovereignty 8.3,8.4,8.11,8.18
space law, general 8.2
spillover 8.8,8.17,8.19
synchronous satellite 8.10
television 8.8,8.9,8.14,8.17-8.19
treaties, international 2.9,8.5,8.14,8.19
UN 5.20,8.2,8.4-8.6,8.12,8.13, 8.15,8.19,8.22
UNESCO 8.6,8.9,8.15,8.16,8.21
U.S. Code 2.8
USSR 8.6,8.14,8.23,8.24
WIPO 8.9,8.15,8.16
Working Groups on DBS 8.17,8.18,8.21
World Administrative Radio Conference (WARC) 8.12,8.21,8.22
Leased channel services 2.12,4.26

M

Mail usage 5.4
Mailgram 2.14
Maghrebvision (No. Africa) 5.4

12. Subject Index , cont'd.

Management, Telecommunications	2.33,5.26
Aerosat, see	
Finance	2.15
INTELSAT; ITU, see	
Management trends in broadcasting	3.10
Maritime communications	2.18,2.32,4.14,8.23
charting telephone cable	4.32
hydrostatic test chamber	4.26
legal issues	8.20
maritime satellite systems	4.2,4.8,4.13,4.18
repeaters	4.26
rescue services	2.18,4.7
voice modulation techniques	4.9
WARC for maritime mobile t/c	8.21
Marketing	
equipment, see	
Europe	6.2
market structure	2.7,6.2
marketplace of future	5.5
research	2.26
revenues, sales	2.24,6.3,6.4
trade	6.1-6.5
Mass media	3.5,8.14
Metaconta System, ITT	4.2
Microwave transmission	2.26
Morocco	5.4
Multiplex equipment	4.11,4.26
N	
NASA	5.7,7.3
ATS	4.10
international telecommunication projects	4.2,4.4,5.7,5.11,5.13
NATO	4.15,8.23
National Academy of Engineering (NAE)	3.10
National Science Foundation (NSF)	5.19
Nordvision	5.23
O	
Oceanic telecommunications, see Maritime	
Off-shore system	4.7
Office of Telecommunications Policy, U.S.	5.13
Orbit use	4.3,4.4,4.18,4.20-4.22,5.12, 5.21,8.7
P	
Point-to-point communications	2.13,4.13
Poland	6.4
Policy and planning, international	2.9-2.11,2.21-2.33,5.5, 5.8,5.10,5.19,5.21,6.4
analyses (U.S.)	2.3,2.9,2.11,5.22
computer	3.8,5.20,5.25
demand forecasting	2.10
developing countries	2.26,7.2,7.3

12. Subject Index, cont'd.

Policy and planning, cont'd

European policy 3.5
INTELSAT 5.10,5.15,5.22
ITU 5.8
law 8.7
regulation 2.1-2.8

Q

R

RCA Globcom 3.6
  data/voice control center 2.16
  diagnostic systems 4.25
  research and development 3.6
  trade (with China) 7.4
Radio communications 4.26,5.21
  frequency spectrum, see
  law 8.2,8.12
  radio relay systems 8.22
  regulation of radio spectrum 8.14
  World Administrative Radio Conference 8.12,8.22
Rates (also see Regulation) 2.37
Record carriers, see International record carriers
Rectiplex 4.11
Regulation 2.2-2.8,5.24
  international 5.6
  regulatory reform 2.3,2.8
  regulatory history 2.4
Repeaters 4.3,4.6,4.22,4.26,5.2
Rescue and warning systems 2.18,4.7,5.3,5.23,8.24
Research and development 3.6,3.10,4.18,4.28,5.14

S

Satellite issues, general 2.4,2.12,2.13,2.16,2.18, 2.19,2.22,2.25,2.26,2.33, 2.35,3.4,4.23,4.24,4.31, 5.7,5.8,5.12
  applications program 3.3,4.3
  broadcasting (also see DBS) 5.5,5.10,5.11
  Comsat, see
  developing countries 7.5
  education 2.12,3.5,4.3,5.20,5.21, 5.26,7.2,7.3,7.5,8.18
  frequency (also see Frequency spectrum) 4.20,4.28,5.21
  history, future of satellite technology 2.31,4.4,4.28,4.31,5.20
  industry, international 2.4,2.37
  law (also see Law) 8.2
  NASA 4.2,4.4,4.10,5.7,5.13,7.3
  NATO 4.5,8.23

12. Subject Index , cont'd.

Satellite issues, cont'd

policy overview	5.10
regional systems	5.4,5.11
satellite/cable issues	2.3,2.5,2.6,2.11,2.23, 2.27,2.29,2.32,4.30,4.32
services, see	
TDMA	4.15,4.25
television, see	
technology, general	4.3,4.4,5.8
antennae	4.19,4.28
aeronautical satellites	4.2,4.9,4.14
altitude control	4.3,4.19
band-stop filter	4.22
design	2.13,4.18,4.19,5.3,8.24, 8.25
echo cancelling devices	4.9
error coding	4.29
frequency bands	4.20,4.23,4.28,5.12
geostationary orbit	3.9,4.32
ion engine	4.22
launching	3.10,4.2,4.31,5.6,5.18
muon beams	4.2
noise-power ratio (NPR)	4.22,4.27
off-shore systems	4.7
orbit use	4.3,4.4,4.18,4.20,4.21, 4.22,5.12,5.21,8.7
propulsion and power	4.4
relays	2.15,4.16
signaling	4.23
SIRIO-SHF experiments	4.9
symphonic satellites	4.18,5.18,5.19,5.23
synchronous satellites	2.15,4.12,4.18,4.22
Scandanavia	5.23
Services	2.12-2.20
banking	2.18,6.5
civil aviation	2.19
computer	5.20
data centers	8.22
data, see	
demand for service (also see Demand)	2.21
fascimile	2.27,4.20
future, history	2.12,4.31,5.20
leased channel	2.12
mailgram	2.14
position finding for ships, aircraft	4.14
press	2.18
rescue services	2.18,4.7
voice, see	
SF submarine cable system	4.6,4.30
SHF	2.27,4.6,4.18,4.28,4.30
SIRIO	4.9
SITE	4.24
Signaling systems	4.2,4.6,4.11,4.16,4.17, 4.23,5.13

12. Subject Index, cont'd.

Skynet satellites	4.15
Socialism	5.15
Solar energy conversion	4.18
South American (also see separate countries)	3.8
Spectrum, see Frequency spectrum	
SPADE system	4.23,4.29
Speech proceeding activities	4.19
Sotre & forward technique	4.27
Submarine telephone cables	2.4,2.23,2.24,2.35,4.21, 4.22,4.25,5.10,5.12
2700-channel system	4.30
cable restoration	2.17
cable/satellite issues	2.3,2.5,2.6,2.11,2.22, 2.23,2.27,2.29,2.32,4.30
charting a cable	4.32
digiplex and rectiplex systems	4.11
philosophy	4.30
revenues	2.24
SF system	2.27,4.6,4.18,4.28,4.30
splicing process	4.24
submarine cable compendium	4.25
TAT-5 system	4.30
TAT-6 decision	2.5
wideband system	4.21
Switching	2.23,4.3,4.6,4.9,4.10, 4.17,4.20,4.23,4.28

T

TASI-B	4.27
TAT-5	4.30
TAT-6	2.5
TDMA	4.15,4.25
Tariffs	2.37
Technology transfer	4.15,5.10,5.19
Telegraph usage	5.4,8.2,8.11
Telephony	
analog systems signaling	4.16
CCITT signaling system 6	4.6,4.11,4.23,4.24
channel interference	4.29
compendium of submarine cables	4.25
ecno cancelling devices	4.9,4.10,4.24
equipment	6.2
IDDD	2.19,2.20,3.4,4.17,4.25
legal issues	8.2,8.12
NT 2000 coin phone	2.19,2.20
PABX suppliers	6.3
rates and tariffs	2.37
satellite phone transmission	2.14,4.5

12. Subject Index , cont'd.

Telephony, cont'd

- submarine telephone cables, see
- survey of phones 6.5
- switching 2.23,4.6,4.9,4.17,4.20
- telephony-telegraphy-telex system 5.5
- usage statistics 5.4

Telephony-telegraph-telex-system 5.5
Telesat 4.2
Television
- digital systems 4.19
- foreign countries, see
- international TV 3.3,5.11,7.2,7.3
- receiver terminals 4.15
- satellite applications 2.17,4.4,4.18,4.24,4.28, 5.10,5.11,5.14,5.26,7.3, 8.2

Terminology, telecommunication 5.10
Time Division Multiple Access (TDMA) 4.15,4.25
Trade 2.21,6.1-6.5
Traffic analyses of telecommunication services 2.10,2.23,2.25,2.29,4.22, 4.23
Transponders 2.23,2.25,4.21
Treaties 2.9
Tunisia 5.4

U

Underseas telephone cables, see Submarine cable
UNESCO 5.22
United Kingdom 3.4
United Nations 5.2,5.7,5.15,5.18,5.20,5.23
- communication agencies 5.22
- working groups on DBS 2.10,8.16,8.18,8.21
- UNESCO 5.22

United States international telecommunications industry 2.1-2.37
- balance of payments 6.2
- computers 2.17,2.28
- Congressional reviews, recommendations 2.6,2.10,2.11,2.36
- demand for service (also see Demand) 2.21
- electronics market 6.2
- FCC 2.3,2.4,2.7,8.4
- facility planning 2.21-2.32
- industry structure 2.2,2.3,2.4,2.6,2.9,2.11, 2.27,2.31,2.33-2.37
- INTELSAT, see
- National security 5.8
- OTP 5.13

12. Subject Index , cont'd.

U.S. industry, cont'd
- policy issues 2.3,2.8,2.10,2.11,2.30, 5.7,5.8,5.10,5.15,5.24, 6.4
- rates and tariffs 2.38
- record carriers 2.3,2.5,2.14,2.36,3.6
- regulation 2.2-2.8,2.33
- revenues 2.24,6.3
- Satellite/cable issue, see
- Services, see
- social issues 2.10
- trade 2.21,6.1-6.5
- treaties 2.9

U.S.S.R.
- earth station 'Mars' 3.10
- education 2.12
- Molniya system 2.16
- trade 6.14
- U.S. relations 2.19,5.7,5.8,5.14,5.27, 8.23

V

Voice communications 4.29
- aeronautical applications 4.8
- digital coding 4.5
- maritime application 4.8
- TASI-B system 4.27
- security 2.13
- voice processing 4.29
- SPADE system 4.23,4.29

W

Warning and rescue systems 2.18,4.7,5.3,5.23,8.24
Western Union International (WUI) 3.6
- IDDS 2.22
- mailgram 2.14
- message switching 4.3

Wideband communication 4.15
WIPO 8.9,8.15,8.16
Working group on direct broadcast satellites 2.10,8.16,8.17,8.18,8.21
World Administrative Radio Conference (WARC) 5.26,8.12,8.22
WARC for Maritime mobile telecommunication 8.21
World Bank 7.5

X

Y

Z